

**OPERATORS MANUAL
AND
PARTS CATALOG**

**ONAN
ELECTRIC GENERATING PLANTS
AK
SERIES**

925-300

9AK65

ADDITIONAL COPY

PRICE \$1.00

Printed In U.S.A.

ONAN DIVISION OF STUDEBAKER CORPORATION
2515 UNIVERSITY AVE. S. E. • MINNEAPOLIS, MINNESOTA 55414

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ONAN ELECTRIC GENERATING PLANTS AK SERIES

925-300

9AK65

PERFORMANCE CERTIFIED

We certify that when properly installed and operated this Onan electric plant will deliver the full power and the voltage and frequency regulation promised by its nameplate and published specifications. This plant has undergone several hours of running-in and testing under realistic load conditions, in accordance with procedures certified by an independent testing laboratory.

ONAN DIVISION of STUDEBAKER CORPORATION
Minneapolis 14, Minnesota

IMPORTANT...RETURN WARRANTY CARD ATTACHED TO UNIT

GENERAL INFORMATION

THIS OPERATOR'S MANUAL PROVIDES INFORMATION FOR PROPER INSTALLATION, OPERATION, AND MAINTENANCE PROCEDURES.

WE SUGGEST THIS BOOK BE KEPT HANDY SO THAT IT CAN BE READILY REFERRED TO WHEN NECESSARY, EITHER FOR ORDERING PARTS OR MAKING PLANT ADJUSTMENTS.

FOR MAJOR REPAIR INFORMATION, USE THE FORM PROVIDED BELOW. A SERVICE MANUAL WILL BE SENT UPON RECEIPT OF \$1.00. INDIVIDUAL WIRING DIAGRAMS ARE AVAILABLE AND WILL BE INCLUDED, WHEN REQUESTED.

PLEASE!

WHEN FILLING OUT THE FORM, BE SURE YOU HAVE INDICATED THE MODEL AND SPEC NUMBER, AND THE SERIAL NUMBER EXACTLY AS SHOWN ON THE UNIT NAMEPLATE. THIS INFORMATION IS NECESSARY TO PROPERLY IDENTIFY THE UNIT AMONG THE MANY BASIC AND SPECIAL MODELS MANUFACTURED.

TRIM ALONG THIS LINE

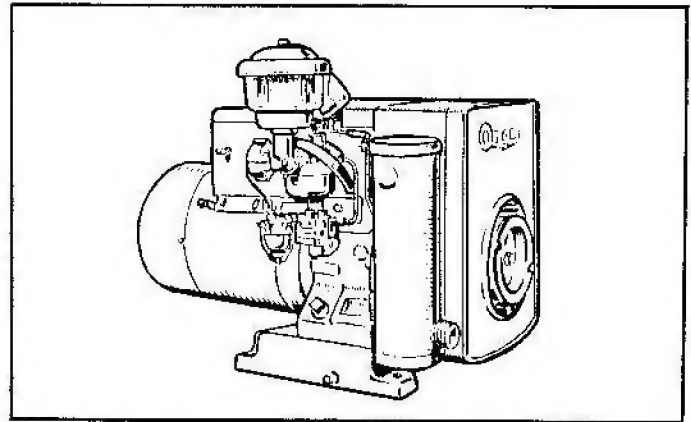
ONAN	
DIVISION of STUDEBAKER CORPORATION	
2515 UNIVERSITY AVENUE S. E. MINNEAPOLIS 14, MINNESOTA	
I ENCLOSE \$1.00. PLEASE SEND ME A	
<u>MAJOR SERVICE MANUAL</u> (Contains details for making all recommended repairs and general overhaul of unit)	
IMPORTANT!	
BE SURE TO INCLUDE COMPLETE MODEL, SPEC., AND SERIAL NUMBER OF UNIT (SEE ONAN NAMEPLATE)	
<u>MODEL AND SPEC.</u> of my unit is _____	
<u>SERIAL NUMBER</u> of my unit is _____	
Name _____	
St. or R. F. D. _____	
City _____ Zone _____ State _____	

INTRODUCTION

Instructions in this manual may refer to a specific model of generating plant, identify the model by referring to the *MODEL AND SPEC. (specification) NO.* as shown on the plant nameplate. Electrical characteristics are shown on the lower portion of the plant nameplate.

ENGINE SPECIFICATIONS

Displacement: 12.2 Cu. In.	HP: 1.85 at 1800 rpm
Bore: 2-1/2"	2.5 at 2400 rpm
Stroke: 2-1/2"	3.7 at 3600 rpm



TYPICAL MODEL AK

How to read MODEL and SPEC. NO.



1. Factory code for general identification.
2. Specific Type:
 - M* - *MANUAL* type. Pull rope starting. For permanent or portable installations.
 - P* - *PORTABLE* type. Pull rope starting. Mounted in carrying frame for portable use.
 - R* - *REMOTE* type. Electric starting. For permanent installation, can be connected to optional accessory equipment for remote or automatic control of starting and stopping.
 - ML* or *PL* - *IDLEOMATIC* type. Same as *M* or *P*, with special no-load automatic speed reduction control.
 - MV* or *RV* - *VACU-FLO* type. Same as *M* or *R*, with reversed (front end duct) cooling air flow.
 - E* - *ELECTRIC* start type. Electric starting at the plant only.
3. Modification Code of a standard unit.
4. Factory code for optional equipment.
5. Specification (Spec.) letter (advances when factory makes production modifications).

MANUFACTURER'S WARRANTY

The Manufacturer warrants, to the original user, that each product of its manufacture is free from defects in material and factory workmanship if properly installed, serviced and operated under normal conditions according to the Manufacturer's instructions.

Manufacturer's obligation under this warranty is limited to correcting without charge at its factory any part or parts thereof which shall be returned to its factory or one of its Authorized Service Stations, transportation charges prepaid, within one year after being put into service by the original user, and which upon examination shall disclose to the Manufacturer's satisfaction to have been originally defective. Correction of such defects by repair to, or supplying of replacements for defective parts, shall constitute fulfillment of all obligations to original user.

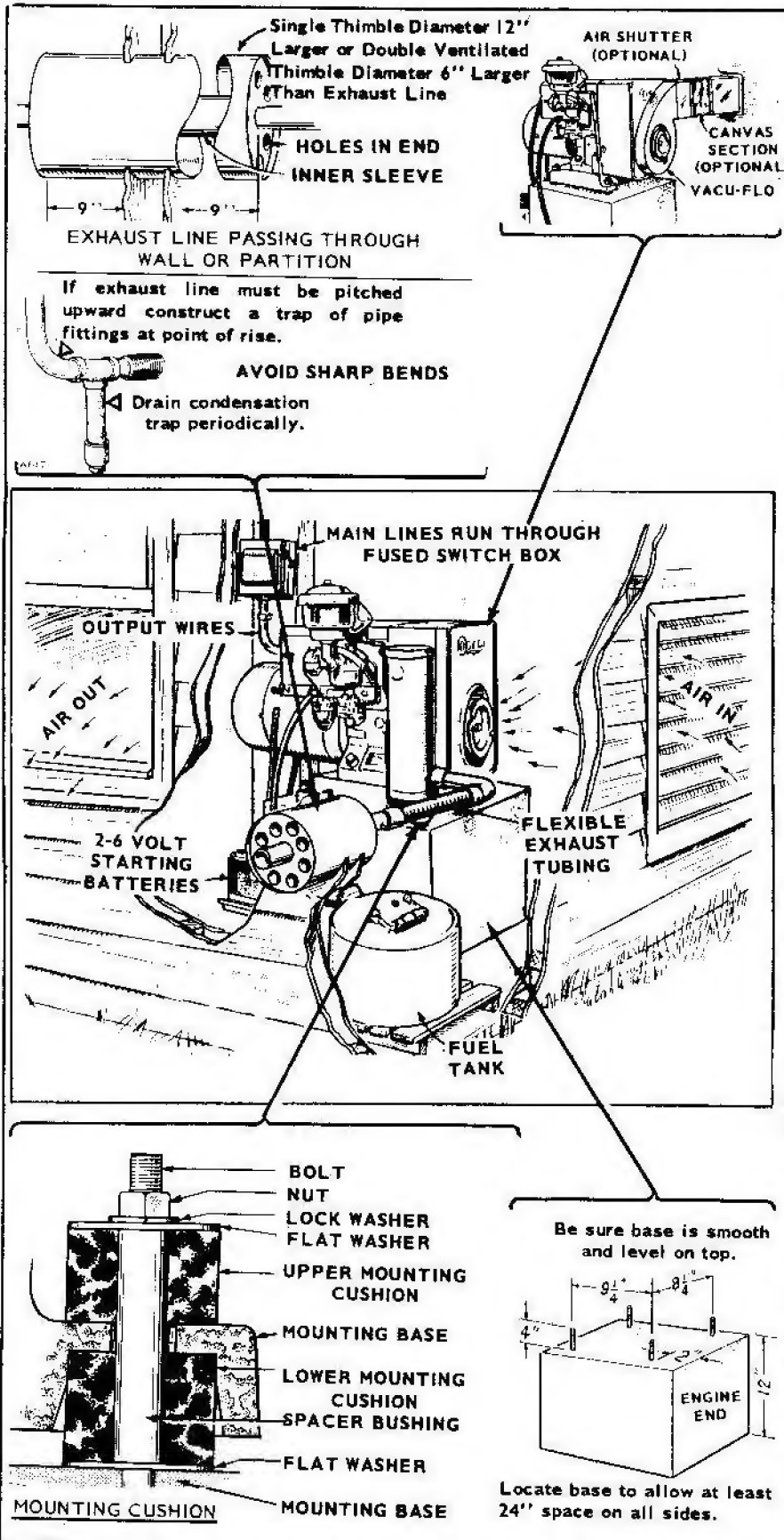
This warranty shall not apply to any of the Manufacturer's products which must be replaced because of normal wear, which have been subject to misuse, negligence or accident or which shall have been repaired or altered outside of the Manufacturer's factory unless authorized by the Manufacturer.

Manufacturer shall not be liable for loss, damage or expense directly or indirectly from the use of its product or from any cause.

The above warranty supersedes and is in lieu of all other warranties, expressed or implied, and of all other liabilities or obligations on part of Manufacturer. No person, agent or dealer is authorized to give any warranties on behalf of the Manufacturer nor to assume for the Manufacturer any other liability in connection with any of its products unless made in writing and signed by an officer of the Manufacturer.

DATED AUGUST 1, 1963

INSTALLATION



COOLING AIR

Pressure cooled plants require an air inlet opening of 1 sq.ft. and an air outlet of 2 sq.ft. Position the outlet opening above and to the rear of the plant, the inlet opening just opposite the blower housing.

VACU-FLO COOLING

Air flow through Vacu-Flo units is reversed. Provide an air inlet of at least 41 sq.in. for 3000 or 3600 rpm units. Duct the heated air outside. An optional automatic air shutter and air duct is available for use in cold weather.

EXHAUST

Vent exhaust gases outside — EXHAUST GASES ARE DEADLY POISONOUS! Use flexible tubing between the plant exhaust outlet and rigid piping. Shield the line if it passes through a combustible wall or partition. If turns are necessary, use long sweeping type elbows. Use one pipe size larger for each 10-ft. in length. Position the exhaust outlet away from the plant air intake.

LOCATION

Provide a protected location that is dry, dust-free, and preferably heated in cold weather. For service convenience, provide at least 24" clearance around plant.

OIL DRAIN

For convenience in draining oil, remove the oil drain plug and install an extension pipe and coupling.

MOBILE INSTALLATIONS

Bolt the plant in place using the mounting cushions. Provide proper ventilation, cooling, service accessibility, etc. Protect against road dust, vibration, and road shock. Follow the principles of installation for a permanent installation. Do not connect to truck engine fuel supply line, provide a separate fuel line to fuel tank. Do not exceed 4 ft. lift from tank bottom to fuel pump.

FIG. 1-1

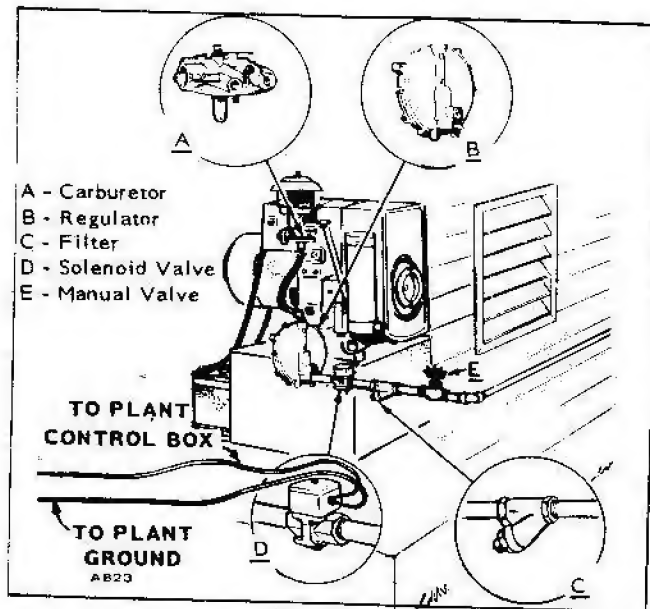


FIG. 1-2

GAS FUEL

Check with the fuel supplier regarding local gas regulations. Provide a manual fuel shut-off valve. A filter in the line may be necessary. An electric solenoid shut-off valve in the supply line is usually required for an indoor automatic or remote starting installation. For 700 or 1500-watt plants, use a fuel solenoid (see Fig. 1-2). A special wiring diagram is supplied with the 1500-watt plants. Manual start type plants cannot use a solenoid valve. Be sure the fuel line pressure is within the 3 to 8 oz. limits of the regulator.

SEPARATE FUEL TANK

Position the tank no lower than 4-ft. below the plant fuel pump. There must be no air leaks in the fuel supply line.

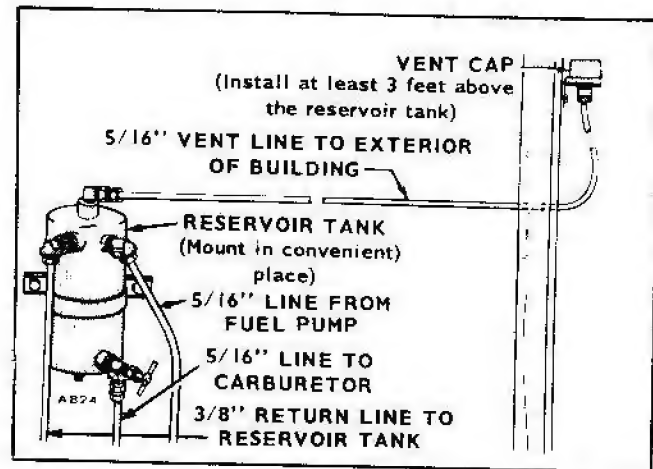


FIG. 1-3

If an auxiliary reservoir fuel tank is used for a standby installation, the fuel line connections must be changed (see Fig. 1-3).

BATTERY

Connect battery as shown in Fig. 1-4, according to the Spec. No. of plant. **CAUTION:** Refer to OPERATION SECTION if it is necessary to run an ac "R" type plant with the battery disconnected. Never operate an "E" type battery charging plant with the battery disconnected.

LOAD CONNECTIONS

For plants with output receptacles, plug directly into the receptacles. Loose leads are provided on "Remote" type plants. Connect with flexible wire (enclosed in Greenfield type shielding or as required by local regulations) between

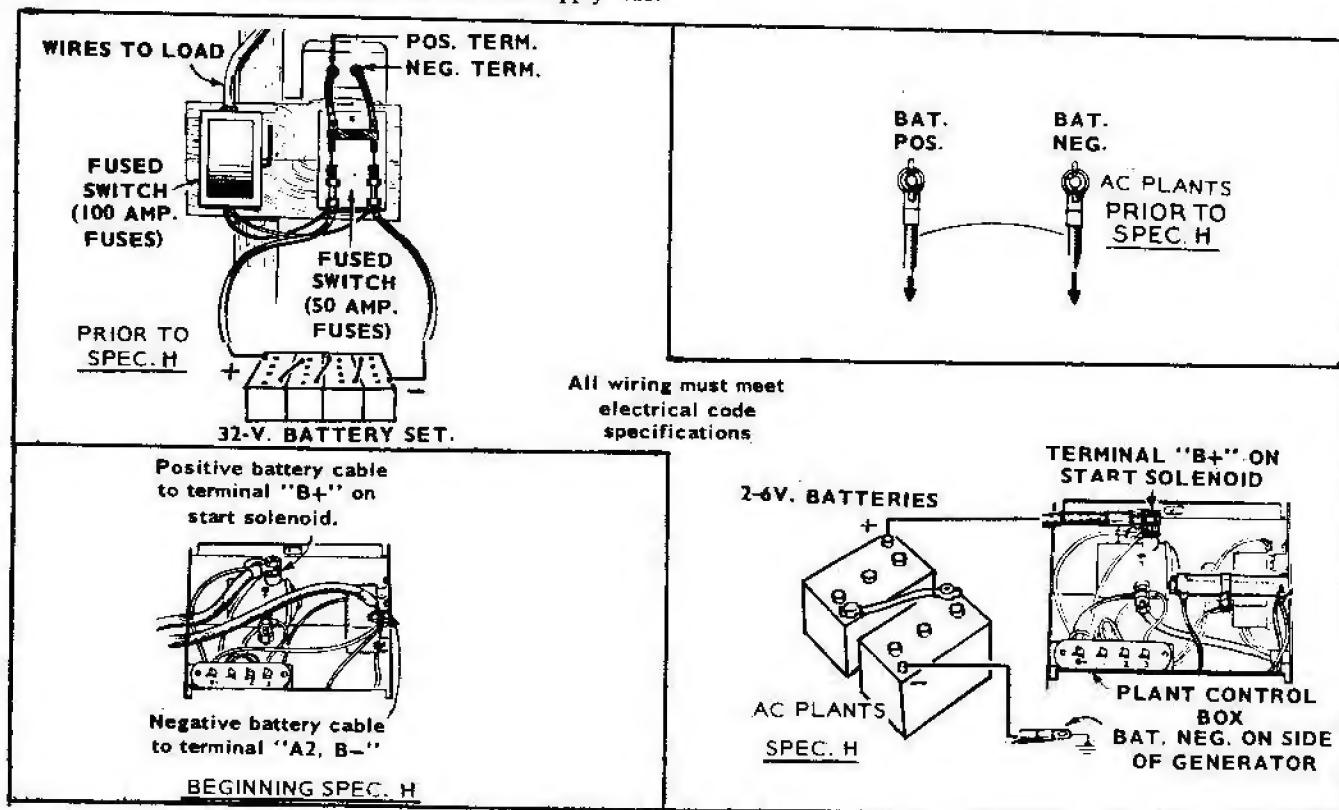


FIG. 1-4

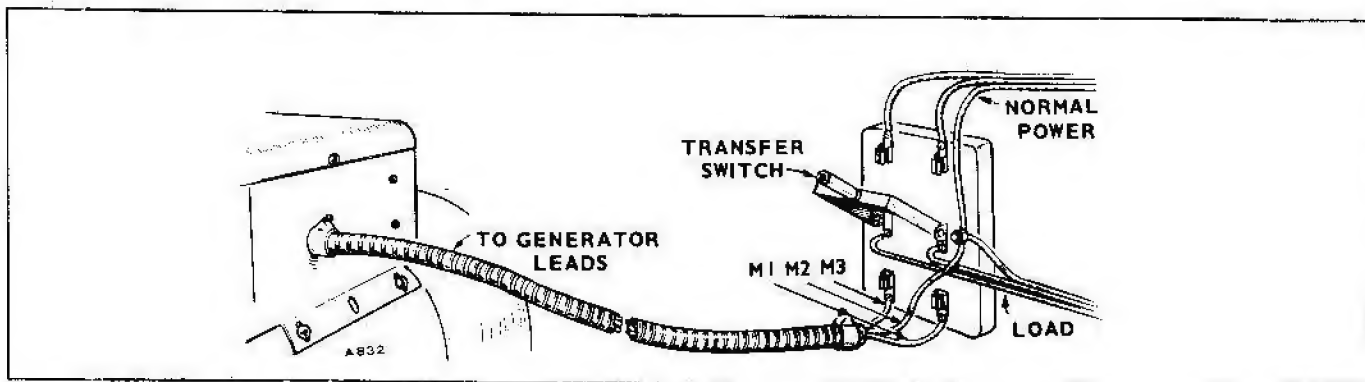


FIG. 1-5

the plant and nearest support point. The generator output lead connections for output voltages are indicated on the plant.

For 2-wire models, connect the load neutral wire (white color code) to the generator M2 lead. Connect the "hot" load wire (black color code) to the generator M1 lead. For 3-wire models, use leads M1-M2 for 120-volt output. Use leads M1-M3 for 240-volt output. Leads M1-M2-M3 are for 120/240-volt output.

To use the plant for standby, install a load transfer switch (manual or automatic) to disconnect the commercial power line when the plant is operating (see Fig. 1-5).

REMOTE START-STOP SWITCH

For remote starting and stopping (Remote type plant) use three wires to connect switch to the terminal block marked B+, 1, 2, 3, in the plant control box. Use #18 wire up to 250-ft., #16 wire up to 400-ft. Connect extra switches in parallel. Use B+ terminal only for *automatic or load transfer* control installation (separate instructions are supplied).

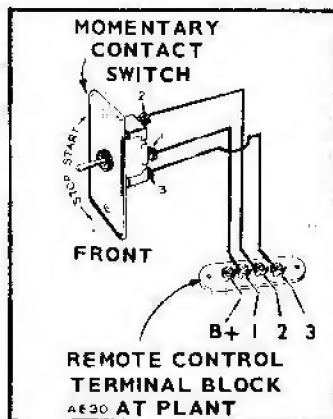


FIG. 1-6

GROUNDING, AC PLANT

A terminal is provided for connecting a ground wire. For permanent installations, connect to a separate ground pipe or rod penetrating into moist earth.

GAS FUEL

Connect the electric fuel solenoid shut-off valve so it is open when the plant is running. See Fig. 1-7 and wiring diagram.

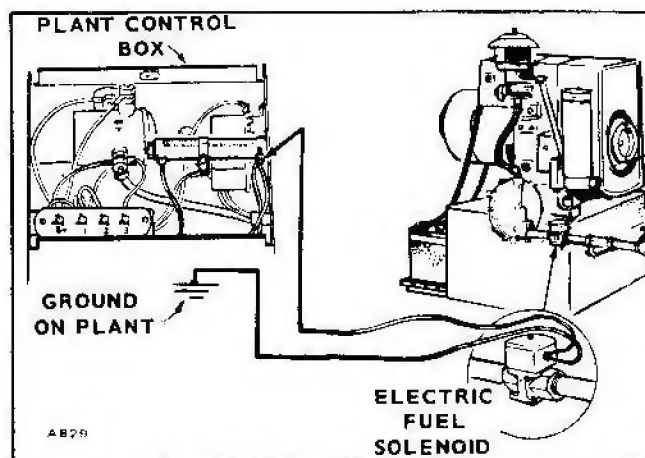


FIG. 1-7

OPERATION

GENERAL

Rust inhibitor oil used at the factory may foul the spark plug. Clean plugs in gasoline, dry and install. After priming a "dry" fuel system, leave the fuel pump hand lever in its down position (see Fig. 2-1).

IMPORTANT: This unit has been factory tested 3 to 4-hours. Additional break-in time is required and will vary depending upon load conditions, oil used, etc. During break-in, apply 1/2 to rated load. Running at near rated load will result in faster break-in and lower oil consumption.

MANUAL STARTING (PORTABLE PLANT)

1. Adjust carburetor choke according to starting temperature conditions.
2. Pull starting rope slowly until piston passes over compression.
3. Rewind the rope to starting position.
4. Pull rope with a fast, steady pull, to crank engine. Do not jerk.
5. As the plant warms up, slowly adjust choke to its full open position.

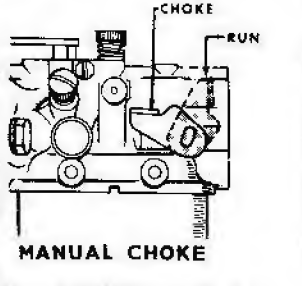
ELECTRIC-STARTING REMOTE-CONTROL AC PLANT

1. Push *start-stop* switch to *start* position.
2. Release the switch when plant starts.
3. If the plant is gas fueled (with solenoid valve in fuel supply line) and has a *hi-lo* battery charge toggle switch, position switch at its *hi* position for each start. The switch can be returned to *lo* for normal operation.

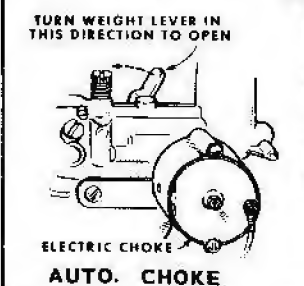
BATTERY CHARGING PLANT

1. Adjust carburetor manual choke according to starting temperature conditions.
2. Push *start* switch to crank the engine.
3. Release *start* switch when the plant starts.
4. As the plant warms up, slowly adjust choke to full open position.

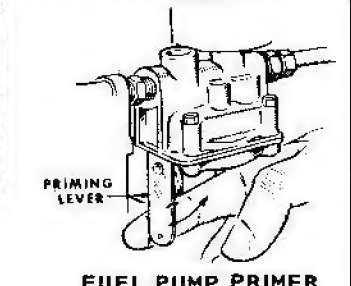
IMPORTANT: Never start or run the plant unless the battery is connected. Be sure the plant-battery switch is closed and fuses are good.




MANUAL CHOKE



ELECTRIC CHOKE
AUTO. CHOKE



FUEL PUMP PRIMER



START ROPE

Use Only Regular Grade Fuel. Do Not Fill Tank With Engine Running. Leave Fuel Expansion Room in Tank.

TURN WEIGHT LEVER IN THIS DIRECTION TO OPEN

PRIMING LEVER

After Priming Fuel System, Return Fuel Pump Primer Lever to Downward Position.

PLANT TYPE	STARTING		PLANT RUNNING	
	1	2	3	4
Manual	Adjust Choke	Pull Start Rope	-----	Adjust Choke
Remote	-----	Push START Switch	Release START Switch	HI Rate * Battery Charge
▲ Battery Charger	Adjust Choke	Push START Switch	Release START Switch	Adjust Choke

▲ DO NOT START OR RUN PLANT WITHOUT BATTERY CONNECTED INTO LOAD CIRCUIT.

* Gaseous fueled plants with electric solenoid valve in fuel supply line only. Switch may be returned to LO rate for normal operation.

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FIG. 2-1

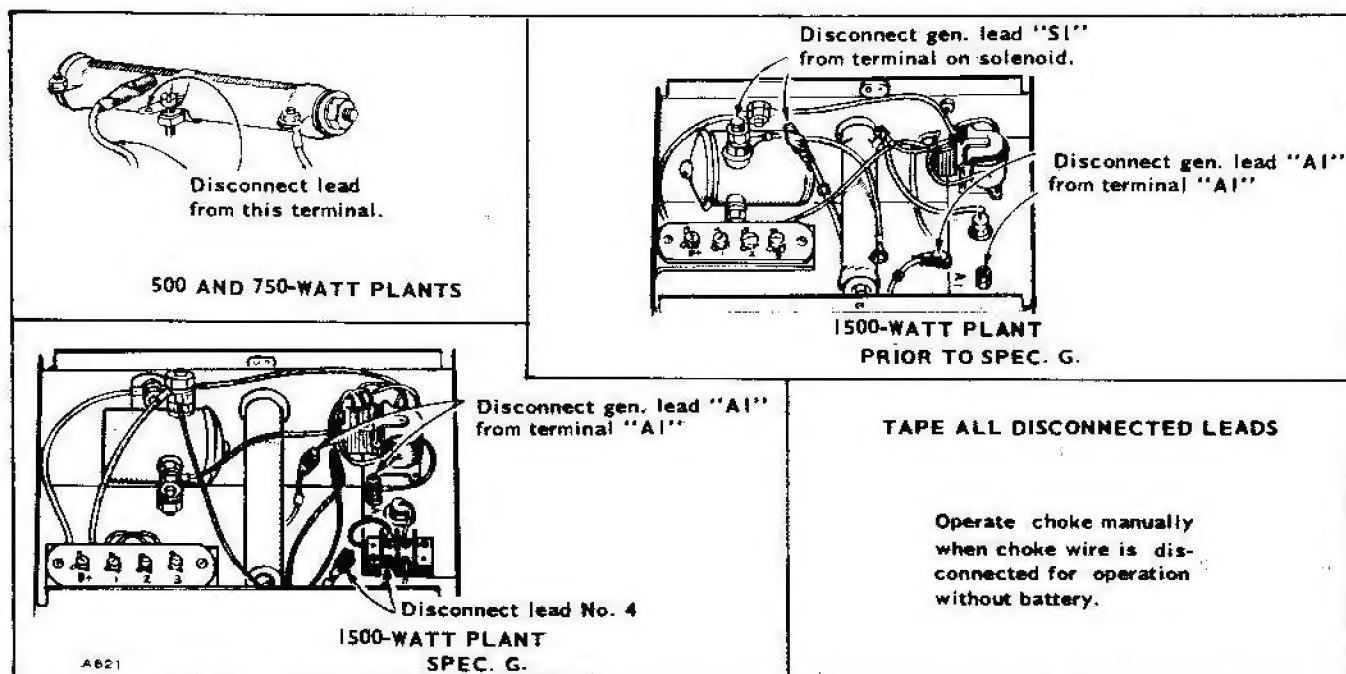


FIG. 2-2

GASOLINE FUEL

Capacity of the mounted tank (manual starting models) is two U.S. gallons. Some models are supplied with a separate 5-gallon tank.

Use "regular" grade automobile gasoline. **DO NOT** use highly leaded "premium" types. Never fill the tank when the engine is running. Leave some tank space for fuel expansion.

MANUAL EMERGENCY START (remote control, ac plant)

1. If the starting battery is connected, follow the Manual Type Plant procedure (ignore choking instructions).
2. If the starting battery is disconnected, certain wires inside the control box *must* also be disconnected, depending upon the plant model (see Fig. 2-2).
 - a. 1500-Watt Model: For Spec G models, disconnect generator lead A1 from terminal A1 and resistor wire 4 from the small terminal block. For models prior to Spec G, disconnect generator leads A1 and S1 from start solenoid terminal S1. Disconnect the electric choke wire at the choke. *Tape all disconnected wires.*
 - b. 500 and 750-Watt Models: Disconnect the wire from the slide charge resistor clip. Disconnect electric choke wire at the choke. *Tape both disconnected wires.*
 - c. Mark the electric choke original setting (see *Adjustment Section*) and re-adjust for full open position. Operate the choke manually while the battery is disconnected (see Fig. 2-1).
 - d. Follow the Manual Type Plant starting procedure.

STOPPING

Press stop switch on the blower housing of manual starting models (on control box of other models) until the plant comes to a complete stop. If the switch is released too soon, the plant will continue to run.

LOAD OPERATION

Warm up the plant before connecting a heavy electrical load. Continuous overloading of the generator may cause overheating and serious damage to the windings. The generator safely handles overloads temporarily, but for normal operation, keep the load within nameplate rating.

ALTERNATING CURRENT PLANTS

Connect the load to manual start plants by inserting load plugs into the output receptacles. Remote control plants are normally installed with a line switch which must be closed to connect the load.

Battery Charge Rate, AC Models: Some plants have a charge rate ammeter and *hi-lo* toggle switch. Use the *lo* position (approximately 1-1/2 amps) for normal operation. Use the *hi* position if frequent starts and short operating periods cause the battery charge condition to fall.

Idle-matic Model: The automatic idle device slows engine speed from its normal 3600 rpm to 1800 rpm when load is removed. Application of a 100-watt load (200-watts for 240-volt models) or more, will cause the engine to resume its normal speed. Do not leave a load of less than 100-watts (200-watts for 240-volt model) connected, as voltage and frequency drop to about 1/2 their rated values during idle operation.

A toggle switch on the outlet box controls idle operation. For automatic idle, set the switch to its *on* position. For continuous high speed operation (no idle when load is disconnected) set the switch to its *off* position.

BATTERY CHARGING PLANT

The battery charge rate depends on engine speed. Regulate by turning the governor adjusting nut (see *Adjustment Section*). Follow recommendations of battery manufacturer for rate of charge, when to charge, etc. *Never operate plant without battery connected to plant.*

INFREQUENT SERVICE

If the plant is used infrequently (as in standby service for commercial power) extended shut-down periods can result in difficult starting. Run the plant at least 30-minutes every week to eliminate hard starting.

EXTENDED OUT-OF-SERVICE PERIOD

If your plant will be out of service for more than 30-days, store as follows:

1. Run the plant until thoroughly warm.
2. Turn off fuel supply and run until plant stops.
3. Drain oil from oil base while still hot. Fill with fresh oil. Attach a warning tag showing oil type and viscosity to assure correct future operation.
4. Remove the spark plug. Pour 1-oz. (two tablespoons) of rust inhibitor (or SAE #50) oil into the cylinder. Crank engine slowly by hand. Leave at top center position. Re-install spark plug.
5. Clean the air cleaner. Do not service with oil.
6. Lubricate the governor linkage. Protect against dust, etc., by wrapping with a clean cloth.
7. Plug exhaust outlet to prevent entrance of moisture, dirt, bugs, etc.
8. Wipe generator brushes, commutator, etc., clean. Do not use any lubricant or preservative.

9. Wipe entire unit. Coat parts likely to rust with a light film of grease or oil.
10. Provide a suitable cover for the entire unit.
11. Disconnect battery and follow standard storage procedure.

HIGH TEMPERATURES

See that nothing obstructs air flow to and from the plant. Keep the cooling fins clean. See that air housings are properly installed and undamaged. Keep ignition timing properly adjusted.

LOW TEMPERATURES

1. Use the proper SAE No. oil for the temperature conditions. Change oil only when engine is hot. If an unexpected temperature drop causes an emergency, move the plant to a warm location, or, apply heat externally until oil flows freely.
2. Use fresh, winter grade (not *premium* type) gasoline. Protect against moisture condensation. Below 0° F. open the carburetor main jet one additional turn. Keep the spark plug and magneto breaker points clean and properly adjusted. Keep batteries in a well charged condition.
3. Partially restrict the flow of cooling air, however, use care to avoid overheating.

DUST AND DIRT

1. Keep the plant clean. Do not allow cooling fins to become coated or obstructed with debris.
2. Service the air cleaner as frequently as necessary.
3. Change crankcase oil every 50 operating hours.

HIGH ALTITUDE

For altitudes of 1500-ft. or more above sea level, close the carburetor main jet adjustment slightly to maintain proper air-to-fuel ratio. Refer to the *Adjustments Section*. Maximum power drops approximately 4% for each 1000-ft. after the first 1000-ft. above sea level.

ADJUSTMENTS

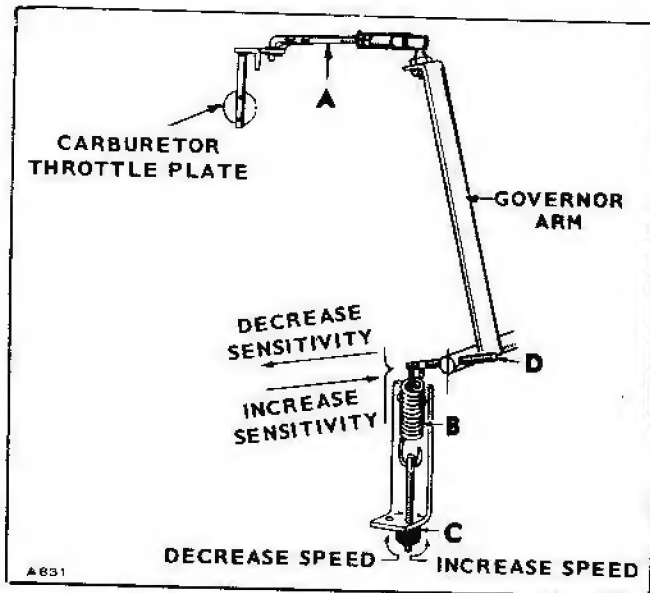


FIG. 3-1

GOVERNOR

The governor controls engine speed and engine speed determines the voltage and frequency of the generator current. On battery charging plants, engine speed also determines battery charge rate. Binding at any point of the governor, linkage, or carburetor throttle, causes slow governor action. Loose or worn parts cause erratic governor action.

With the plant stopped, the length of linkage A must (with tension on spring B) allow the carburetor throttle stop lever to just clear (maximum 1/32-in.) the carburetor body (Fig. 3-1). Alter linkage length by turning the bail joint on the threaded rod. Run the plant (under load) to thoroughly warm it up.

1. **Alternating Current Plant:** Connect a voltmeter across the generator output. With the plant operating at no-load, adjust the speed nut C (Fig. 3-1) for a voltmeter reading of 126-volts for 120-volt plants (252-volts for 240-volt plants). Voltage should not fall below 108-volts for a 120-volt plant (216-volts for a 240-volt plant) under full rated load.

If voltage drop from no-load is too great, turn sensitivity screw D clockwise. If voltage drop is within the above limits, but is unsteady with a tendency to alternately increase and decrease, turn the sensitivity screw counter-clockwise. Any change in the sensitivity screw D setting requires a compensating change in the speed adjustment nut C.

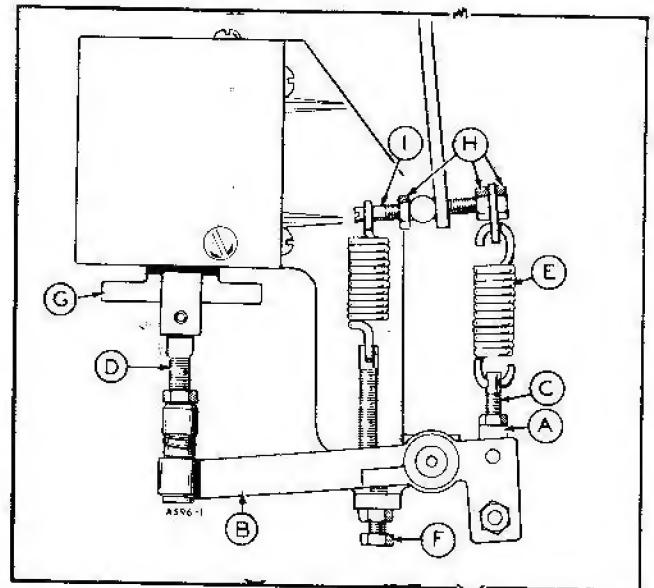


FIG. 3-2

2. **Automatic Idle Plant:** The special idle device drops engine speed to approximately 1800 rpm when the plant is operating at no-load (without an electrical load connected). The idle device automatically restores operating speed when an electrical load (100-watts or more for 120-volt models) is connected.

Set the idle control switch at the *off* position, and no tension on its spring E, Fig. 3-2. Be sure the carburetor is properly adjusted. Temporarily disconnect flexible joint A from lever B. Its socket slips off the ball. Adjust the governor for normal 3600 rpm operation under no-load to full-load conditions, with nuts H loosened. Tighten lock nuts H, with spring E as close to the end of the sensitivity screw as possible. Reconnect joint A to lever B. Turn stop adjusting screw F down for maximum lever movement.

Set the idle control switch to *on* position. With all electrical load removed, the solenoid should pull up and provide sufficient tension on spring E to over-ride the tension of the regulating governor spring and reduce engine speed to about 1800 rpm. Output at 1800 rpm should be about 55-volts. If idle speed and output voltage are too high, linkage C or D is too long. If idle speed and output voltage are too low, linkage C or D is short. With a full electrical load connected, the solenoid plunger should drop downward. Adjust screw F so spring E is firm but not stretched. Tighten all lock nuts.

WARNING: Never operate plant with solenoid plunger G removed (unless control toggle switch is OFF).

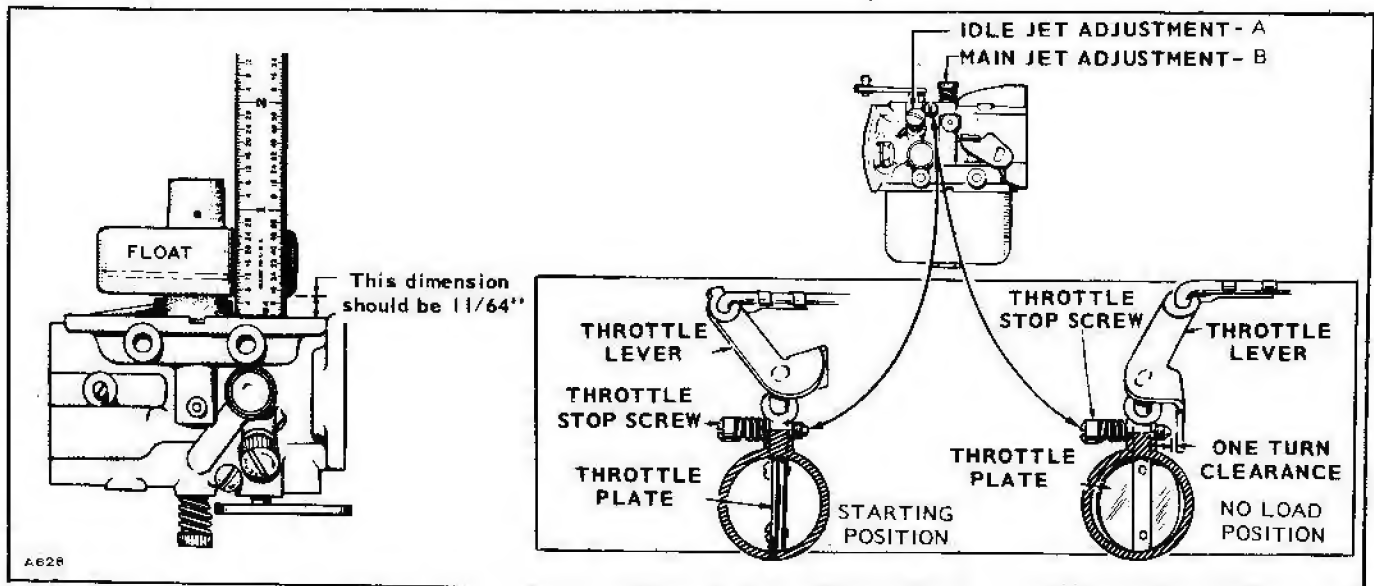


FIG. 3-3

3. **Battery Charging Plant:** Turn speed nut C (Fig. 3-1) to give the desired charge rate. Normal speed, as specified on the nameplate, is approximately 2400 rpm. If the charge rate tends to "taper off" too soon, turn the sensitivity screw D clockwise. If the charge rate is unsteady, turn the sensitivity screw D counterclockwise.

CARBURETOR ADJUSTMENT

If the carburetor is completely out of adjustment, turn the idle adjustment (Fig. 3-3) and main adjustment needle B in gently onto their seats. Do not use force - tight seating causes damage. Back off idle needle A one turn and main needle B 2-1/2 turns to permit starting the plant.

Start the plant and allow it to warm up. With full rated load connected, turn main needle B in slowly until the plant begins to lose speed (or voltage drops). Then turn the needle back out to the point where the plant will carry the full load. Check operation under various loads. If there is any tendency to hunt, turn the needle B (out) to the point where operation is steady. Do not turn out more than 1/2 turn past the point of smooth full-load operation. Continuous unstable operation may be due to improper governor adjustment. Adjust idle needle A with no ac load connected (or at the lowest possible charge rate if unit is a battery charging plant). Turn the needle in slowly until the plant loses speed. Then turn the needle out to the point of smooth operation. With the plant still running under no-load, turn the throttle lever stop screw D so it just touches the stop lever, then back off one full turn.

AUTOMATIC CHOKE

Gasoline Fuel: Normal choke setting is approximately 1/8" from its closed position at 70°F. If temperature changes require choke adjustment, loosen two screws at A (Fig. 3-4). Turn the cover assembly counterclockwise to decrease choking. To increase choke turn clockwise, Tighten both screws to lock cover in place.

Gas Fuel: Normal choke setting is fully closed with engine not running. Turn adjusting screw (Fig. 3-4) in for less choking, out for more choking.

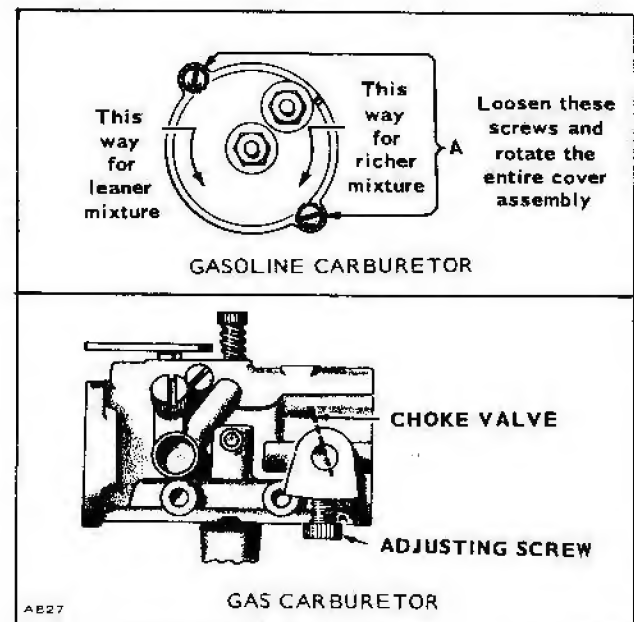


FIG. 3-4

MAINTENANCE

AIR CLEANER

Use the same type and viscosity oil as used for crankcase lubrication.

Oil Bath Type: Remove cup and clean before dirt level reaches shelf in cup. Fill cup with oil to the indicated oil level.

Dry Type: Remove filter element and clean. Dip element in lubricating oil. Drain excess oil from element and replace on engine.

GOVERNOR LINKAGE

Lubricate the linkage at the carburetor and ball joint ends with powdered graphite (preferably), or a light, sewing machine type oil. Do not lubricate plastic ball joints, they only require cleaning.

CRANKCASE OIL

Oil capacity is 3-1/2 U.S. pints (2-1/2 pints for portables). Fill to the top threads of the oil fill hole. Use a good quality detergent oil classified for service MS or MS/DG. Do not use service DS oil at any time. Use a single viscosity oil; oil consumption is usually higher with multi-viscosity *all weather* oil. Use the proper SAE number of oil for the expected temperature conditions. Do not mix brands or grades, extremely dusty or low temperature conditions require oil change at 50-hrs.

Above 90°F	SAE 50
30°F to 90°F	SAE 30
0°F to 30°F	SAE 10W
Below 0°F	SAE 5W

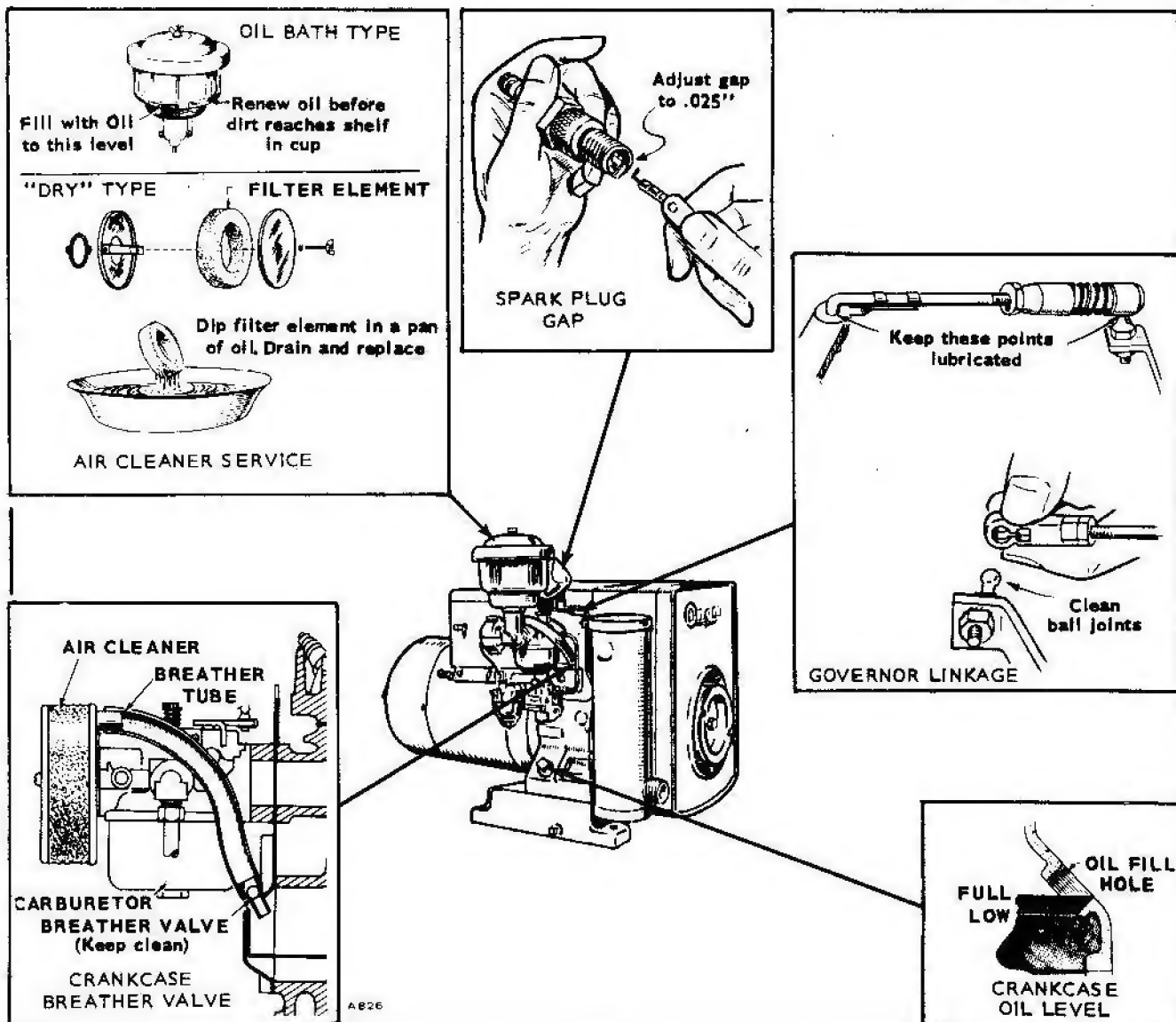


FIG. 4-1

Use this factory recommended maintenance (based on favorable operating conditions) to serve as a guide to get long and efficient plant life. Neglecting routine maintenance can result in failure or permanent damage to the plant. Maintenance

is divided into two categories: (1) **OPERATOR MAINTENANCE** – performed by the operator, and (2) **CRITICAL MAINTENANCE** – performed by qualified service personnel (ONAN dealer). A Major Service Manual is available (see general information page) if needed.

OPERATOR MAINTENANCE SCHEDULE				
MAINTENANCE ITEMS	OPERATIONAL HOURS			
	8	50	100	200
Inspect Plant	X			
Check Fuel	X			
Check Oil Level	X			
Check Air Cleaner		XI		
Clean Governor Linkage		XI		
Check Spark Plug			X	
Change Crankcase Oil			XI	
Clean Crankcase Breather			X	
Clean Fuel System				X
XI - Perform more often in extremely dusty conditions.				
Spark Plug Gap	gasoline		0.025"	
	gas		0.018"	
BOLT TORQUES:	FT-LB			
Cylinder Head	24-26			
Oil Base Mounting	25-30			

For any abnormalities in operation, unusual noises from engine or generator, loss of power, overheating etc., contact your ONAN dealer.

CRITICAL MAINTENANCE SCHEDULE				
MAINTENANCE ITEMS	OPERATIONAL HOURS			
	200	500	1000	5000
Inspect Magneto Breaker Points	X			
Clean Commutator and Collector Rings	XI			
Check Brushes	X2			
Remove Carbon & Lead		X		
Clean Generator			X	
Remove and Clean Oil Base			X	
Grind Valves			X	
Clean Carburetor			X	
General Overhaul				X
XI - Perform more often in extremely dusty conditions.				
X2 Replace commutator brushes when worn to 5/8" or less.				
Tappets (Intake & Exhaust)		0.010"	0.012"	
Magneto Pole Shoe Air Gap		0.010"	0.015"	
Magneto Breaker Point Gap			0.022"	
Ignition Timing 2500 RPM			25° BTC	
1800 RPM			19° BTC	
Smooth commutator and collector rings with #00 sandpaper - never use emery or carborundum abrasives.				

MAJOR SERVICE MANUAL IS AVAILABLE - SEE GENERAL INFORMATION

MAINTENANCE DIAGNOSIS

POSSIBLE CAUSE	REMEDY	POSSIBLE CAUSE	REMEDY
ENGINE WILL NOT CRANK		Poor compression.	
Battery discharged.	Recharge.	Tighten spark plug.	
Loose connections.	Tighten connections.	Wrong breaker point gap.	
Defective starting circuit.	Repair or replace as necessary.	Reset breaker points.	
Defective switch.	Replace.	EXCESSIVE OIL CONSUMPTION, LIGHT BLUE SMOKY EXHAUST	
ENGINE CRANKS TOO STIFFLY		Oil leaks from oil base or connections. This does not cause smoky exhaust.	
Too heavy oil in crankcase.	Drain, refill with lighter oil.	Replace gaskets. Tighten screws and connection. Check breather valve.	
ENGINE WILL NOT START WHEN CRANKED		Oil too light or diluted.	
Lack of fuel or faulty carburetion.	Refill tank. Check fuel system. Clean, adjust, as necessary.	Drain, refill with correct oil.	
Clogged fuel screen.	Clean.	Engine misfiring.	
Cylinders flooded.	Crank few times with spark plug removed.	Clean, adjust, or replace spark plug	
Poor fuel.	Drain, fill with fresh fuel.	Faulty ignition.	
		Clean, adjust, or replace spark plug	
		Too much oil.	
		Drain excess oil.	

<u>POSSIBLE CAUSE</u>	<u>REMEDY</u>	<u>POSSIBLE CAUSE</u>	<u>REMEDY</u>
BLACK, SMOKY EXHAUST, EXCESSIVE FUEL CONSUMPTION, FOULING OF SPARK PLUG WITH SOOT, POSSIBLE LACK OF POWER UNDER HEAVY LOAD		ENGINE MISFIRES AT HEAVY LOAD	
Fuel mixture too rich.	Adjust carburetor or choke. Install needed carburetor parts.	Spark plug gap too wide.	Adjust gap.
Choke not open.	Inspect linkage and setting.	Faulty ignition.	Clean, adjust or replace spark plug
Dirty air cleaner.	Clean.	Clogged carburetor.	Clean jet and adjust carb.
Excessive crankcase pressure, causing excessive fuel pump pressure.	Clean breather valve.	Clogged fuel screen.	Clean
ENGINE STOPS UNEXPECTEDLY		ENGINE BACKFIRES	
Fuel tank empty.	Fill with fresh fuel.	Lean fuel mixture.	Clean or adjust carburetor.
Defective ignition.	Check ignition system.	Poor fuel.	Refill with good, fresh fuel.
SHARP METALLIC THUD, ESPECIALLY WHEN COLD ENGINE FIRST STARTED		ENGINE RACES	
Low oil supply.	Add oil.	Governor not controlling carburetor.	Check governor performance & linkage condition.
Oil badly diluted.	Change oil.	ENGINE OVERHEATING	
PINGING SOUND WHEN ENGINE IS SUDDENLY OR HEAVILY LOADED		Poor air circulation.	Clean cooling fins.
Wrong spark plug.	Install correct spark plug.	Improper lubrication.	See Low Oil Pressure.
Spark plug burned or carboned.	Install new plug.	Fuel mixture too lean.	Adjust carburetor.
Fuel stale or low octane.	Use good, fresh fuel.	Generator overloaded.	Reduce load.
Lean fuel mixture.	Clean & adjust carburetor.	VOLTAGE LOW AT FAR END OF LINE BUT NORMAL NEAR POWER PLANT	
LIGHT POUNDING KNOCK		Too small line wire for load and distance.	Install larger or extra wires or reduce load.
Low oil supply.	Add oil.	ELECTRIC MOTOR RUNS TOO SLOWLY AND OVERHEATS AT FAR END OF LINE BUT OK IF USED NEAR POWER UNIT	
Oil badly diluted.	Change oil.	Too small line wire for load and distance.	Install larger or extra wires or reduce load.
ENGINE MISFIRES AT LIGHT LOAD		VOLTAGE UNSTEADY BUT ENGINE NOT MISFIRING	
Spark plug gap too narrow.	Adjust to correct gap.	Speed too low.	Adjust governor to correct speed.
Intake air leak.	Tighten or replace manifold and carburetor gaskets.	Loose connections.	Tighten connections.
Faulty ignition.	Clean, adjust or replace spark plugs.	Fluctuating load.	Correct any abnormal load condition causing trouble.
Low compression.	Tighten cylinder head and spark plug	GENERATOR OVERHEATING (Approximately 160°F higher than ambient)	
		Overloaded.	Reduce load.

<u>POSSIBLE CAUSE</u>	<u>REMEDY</u>	<u>POSSIBLE CAUSE</u>	<u>REMEDY</u>
VOLTAGE DROPS UNDER HEAVY LOAD			
Engine lacks power.	See remedies for engine misfires under heavy load.	Dirty air cleaner.	Clean.
Poor compression.	Tighten cylinder head & spark plugs.	Restricted exhaust line.	Clean or increase the size.
Faulty carburetion.	Clean the fuel system. Clean, adjust or replace parts necessary.	Choke partially closed.	See that it opens fully.

PARTS CATALOG

This parts catalog applies to *ONAN* Generating Plant, Series AK.

Parts are arranged in groups of related items. Each illustrated part is identified by a reference number corresponding to the same reference number in the Parts List for the group.

Common hardware items such as screws, washers, nuts, etc., which are available locally are not listed.

INSTRUCTIONS FOR ORDERING REPAIR PARTS

For parts or service, contact the dealer from whom you purchased this equipment or refer to your Nearest Authorized Parts & Service Center.

To avoid errors or delay in filling your parts order, please furnish all information requested.

Always refer to the nameplate on your plant:

1. Always give the **MODEL & SPEC. NO.** and **SERIAL NO.**

ELECTRIC **ONAN** PLANT

MODEL AND SPECIFICATION NO. SERIAL NO.

IMPORTANT RATINGS AT SEA LEVEL BASED ON FUEL CHECKED BELOW:

GASOLINE DIESEL FUEL

STAND BY KW KVA AMPS

CONTINUOUS KW KVA AMPS

A.C. VOLTS CYCLES PHASE P.F.

EXCITER GEN. DATA

E.P.M. USE VOLT BATTERY NEGATIVE GROUND

MANUFACTURED BY
ONAN
ONAN ENGINE CO. 1400 WABASH AVE.
MINNEAPOLIS, MINN. 55404

For handy reference, insert **YOUR** plant nameplate information in the spaces above.

2. Do not order by reference number or group number, always use part number and description.
3. Give the part number, description and quantity needed of each item. If an older part cannot be identified, return the part prepaid to your dealer or nearest **AUTHORIZED SERVICE STATION**. Print your name and address plainly on the package. Write a letter to the same address stating the reason for returning the part.
4. State definite shipping instructions. Any claim for loss or damage to your unit in transit should be filed promptly against the transportation company making the delivery. Shipments are complete unless the packing list indicates items are back ordered.

Prices are purposely omitted from this Parts Catalog due to the confusion resulting from fluctuating costs, import duties, sales taxes, exchange rates, etc.

For current parts prices consult your Onan Dealer, Distributor, or Parts and Service Center.

"En esta lista de partes los precios se omiten de proposito, ya que bastante confusion resulto de fluctuaciones de los precios, derechos aduanales, impuestos de venta, cambios extranjeros etc.

Consiga los precios vigentes de su distribuidor de productos "ONAN".

PARTS CATALOG

This catalog applies to AK generating plants listed in the Plant Data Table below.

Use this catalog as a guide in selecting parts. Onan manufactures many types of generating plants and industrial engines, with optional features in each basic series. Always give the MODEL, SPEC. NO. and Serial Number, when referring to the plant. Compare the plant nameplate MODEL and SPEC. NO. with the Plant Data Table. Select the Parts Key No. (1, 2, etc., in the last column) that applies to your plant. This Parts Key No. appears in the Parts Description and indicates which parts to order for your generator or engine. Certain descriptions contain additional information, such as the voltage of the plant. Reference is sometimes made to Spec A, B, etc. This refers to the LETTER at the end of the plant MODEL and SPEC. NO. This Spec LETTER advances (A to B, B to C, etc.) with manufacturing changes. Unless otherwise indicated, parts are interchangeable between various models.

PLANT DATA TABLE

MODEL AND SPEC. NO.	TYPE**	ELECTRICAL DATA				PARTS KEY
		WATTS	VOLTS***	CYCLES	RPM	
05AK-1M/, 05AK-1MV 05AK-2M/, 05AK-2MV	MANUAL MANUAL	500 500	120AC 240AC	60 60	1800 1800	1 1
05AK-1R/, 05AK-1RV 05AK-2R/, 05AK-2RV	REMOTE REMOTE	500 500	120AC 240AC	60 60	1800 1800	2 2
07AK-1M/, 07AK-1MV 07AK-2M/, 07AK-2MV	MANUAL MANUAL	750 750	120AC 240AC	60 60	1800 1800	3 3
07AK-1R/, 07AK-1RV 07AK-2R/, 07AK-2RV	REMOTE REMOTE	750 750	120AC 240AC	60 60	1800 1800	4 4
05AK-206E/, 05AK-206EV	BAT. CHG.	500	6	DC	2400	5
****06AK-212E/, 06AK-212EV	BAT. CHG.	600	12	DC	2300	6
****06AK-224E/, 06AK-224EV	BAT. CHG.	600	24	DC	2200	6
07AK-224E/, 07AK-224EV 07AK-232E/, 07AK-232EV	BAT. CHG. BAT. CHG.	750 750	24 32	DC DC	2200 2200	7 7
102AK-51M/, 102AK-51MV 102AK-52M/, 102AK-52MV	MANUAL MANUAL	1250 1250	120AC 240AC	50 50	3000 3000	8 8
102AK-51P/ 102AK-52P/	PORTABLE PORTABLE	1250 1250	120AC 240AC	50 50	3000 3000	9 9
105AK-1M/, 105AK-1MV 105AK-2M/, 105AK-2MV	MANUAL MANUAL	1500 1500	120AC 240AC	60 60	3600 3600	8 8
105AK-1P/, 105AK-2P/	PORTABLE PORTABLE	1500 1500	120AC 240AC	60 60	3600 3600	9 9
105AK-115M/	MANUAL	1500	115	DC	2600	10
102AK-51ML/, 102AK-51PL/, 102AK-52ML/, 102AK-52PL, 105AK-1ML, 105AK-1PL/, 105AK-2ML/, and 105AK-2PL/ with Automatic Idle Control — SEE SPECIAL GROUP						

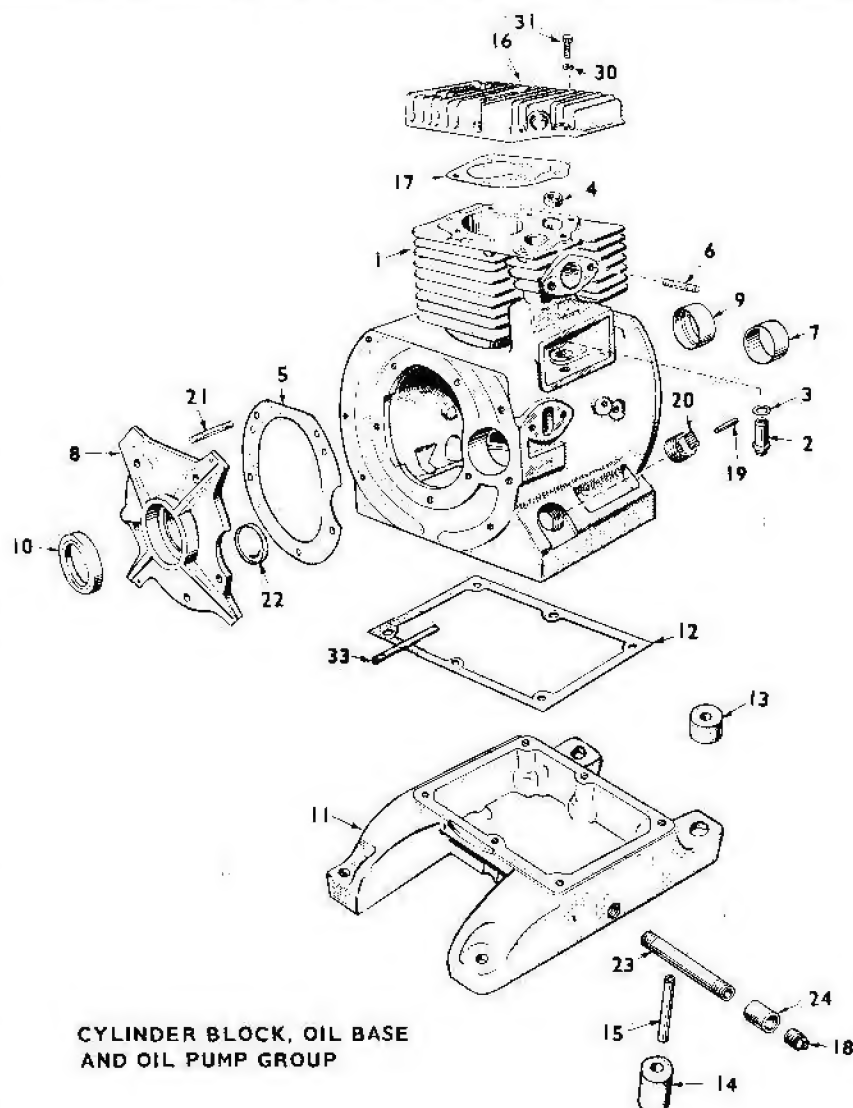
* - Spec Letter advances with manufacturing changes (A to B, B to C, etc.)

** - Manual type plants are suitable for stationary or portable service (pull rope cranking only). Portable type plants are designed for easy mobility (pull rope cranking). Remote plants are primarily designed for permanent installations. Batteries are required for electric starting at the plant or from a remote switch.

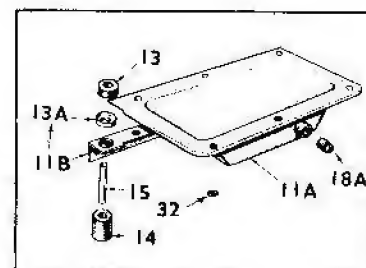
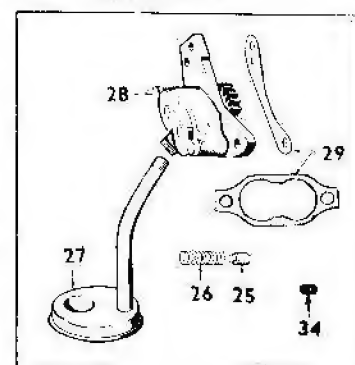
Battery charging type plants must be used with batteries (electrically cranked).

*** - Reference to 120, 240, and 120/240-volt also applies to 115, 230, and 115/230-volt.

**** - Identical to early models stamped 05AK-212E/ or 05AK-212EV/.



CYLINDER BLOCK, OIL BASE
AND OIL PUMP GROUP



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	CYL. BLOCK ASSEMBLY (INCLUDES PARTS MARKED*)		
	110A901	1	Key 8,9
	110K874	1	Key 1 through 6 and 10
	110K874	1	Key 7 (24-V to Spec K, All 32-V)
	110K876	1	Key 7 (24-V Begin Spec K)
2	110A441	2	*Guide, Valve
3	110A68	1	*Gasket, Intake Val. Guide
4	110A826	1	*Insert, Exh. Valve Seat
5	101K257	1	*Gasket Kit, Brg. Plt. to Eng. (one .015", two .006")
6	520A363	2	Stud - 1/4 x 1-9/16" Carb. Mtg.
7	101A367	2	*Bearing, Precision Camshaft (Replaces 101A49)
8	*PLATE, REAR BEARING AND GEN. TO ENG. BEARING)		
	101C233	1	Key 1,2,3,4,5,6,10
	101C252	1	Key 8,9
	101C233	1	Key 7 (24-V to Spec K, All 32-V)
	101C252	1	Key 7 (24-V Begin Spec K)
9	101B290	2	*Bearing, Precision Crankshaft (Front or Rear) Specify: Std., .002", .010", .020", or .030" Undersize (Replaces 101A234)
10	509A41	1	Seal, Oil - Crankshaft Rear (Replaces 509A1)

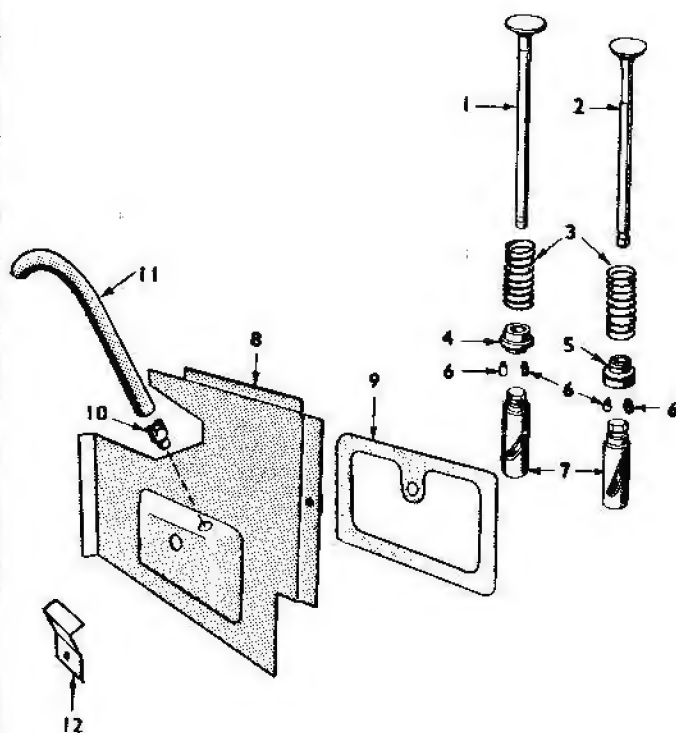
REF. NO.	PART NO.	QTY. NO.	PART DESCRIPTION
11	BASE, OIL 102D313	1	Key 1,2,6,7 to Serial #627846 (3 Pints)
	102D439	1	Key 1, 2, 6, 7 Begin Serial #627846 (3-1/2 Pints)
	102D439	1	Key 3,4,5,8,10 (Replaces 102D314)
11A	102A319	1	Pan, Oil - Key 9
11B	403A381	1	Bracket, Eng. Mtg. - (2 End Centering Cups) Key 9
12	102B18	1	Gasket, Oil Base or Pan (Replaces 102B348)
13	CUSHION, RUB. MTG. - UPPER -		
	402A44	4	Key 1,2,6,7 To Serial #637846
	402A76	4	Key 1,2,6,7 - Begin Serial #637846
	402A44	4	Key 3, 4, 5, 8, 10 To Serial #632290
	402A76	4	Key 3, 4, 5, 8, 10 Begin Serial #632290
	402A76	4	Key 7
13A	402A140	2	Cup, Centering, Upper Cushions (Gen. End) Key 9
14	CUSHION, RUB. MTG. (LOWER)		
	402A45	4	Key 1,2,3,4,5,6,7,8,10
	402A45	2	Key 9 (Gen. End)
	402A144	2	Key 9 (Eng. End)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
15	BUSHING, CUSHION SPACING -		
	402A48	4	Key 1,2,6,7 to Serial #637846
	402A141	4	Key 1,2,6,7 Begin Serial #637846
	402A48	4	Key 3,4,5,8,10 To Serial #632290
	402A141	4	Key 3,4,5,8,10 Begin Serial #632290
	402A142	2	Key 9 (Eng. End)
	402A141	2	Key 9 (Gen. End)
16	HEAD, CYLINDER		
	110C834	1	Std. Compression (Gasoline Plants)
	110C1192	1	High Compression (Gaseous Plants)
17	110C836	1	Gasket, Cyl. Hd.
18	505-110	1	Plug, 3/8" Oil Drain
18A	505-54	1	Plug, 1/4" Oil Drain, Key 5,7
19	516A12	2	*Pin, Dowel - Gear Cover Align
20	505-130	1	Plug, 3/4" Oil Fill
21	520A526	5	*Stud, Rear Bearing Plate
22	517-48	1	*Plug, Expan. Rear Cam.Brg. Opening (Replaces 517-18)
23	505-76	1	Nipple, Pipe (3/8" x 3") Oil Drain Exten.
24	505-28	1	Coupling, Pipe (3/8") Oil Drain Exten.
25	120A12	1	Plunger, Oil By-Pass, Key 8,9 (Also Key 7,

REF. NO.	PART NO.	QTY. NO.	PART DESCRIPTION
26	120A140	1	24-V Begin Spec K) Spring, Oil By-Pass Plunger, Key 8,9 (Also Key 7, 24-V, Begin Spec K)
27	CUP AND PIPE, OIL PUMP INTAKE (INCL.SCREEN)		
	120A571	1	Key 7 (24-V Begin Spec K)
	120A389	1	Key 8,9 To Spec G
	120A571	1	Key 8,9 Begin Spec G
28	PUMP OIL -		
	120A394	1	Key 7 (24-V Begin Spec K)
	120A200	1	Key 8,9 To Spec G
	120A394	1	Key 8,9, Begin Spec G
29	120K161	1	Gasket Kit, Oil Pump Key 8,9 (Also Key 7 24-V, Begin Spec K)
30	526A208	7	Washer, Cyl. Hd. (Hardened)
31	SCREW, HARDENED		
	110A879	4	Cyl. Head - 5/16-18 x 1-1/4"
	110A284	3	Cyl. Head - 5/16-18 x 1-1/2"
	110A284	2	Gear Cover - 5/16-18 x 1-1/2"
32	526A127	3	Washer, Oil Pan Mtg. - Key 5, 7
33	120A387	1	*Tube, Crankcase (Pressed in Block) Key 8,9 (Also Key 7, 24-V, Begin Spec K)
34	505-274	1	Plug, Oil By-Pass - 1/8 x 1/4", Key 8,9 (Also Key 7, 24-V, Begin Spec K)

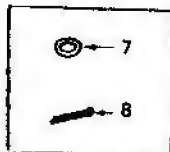
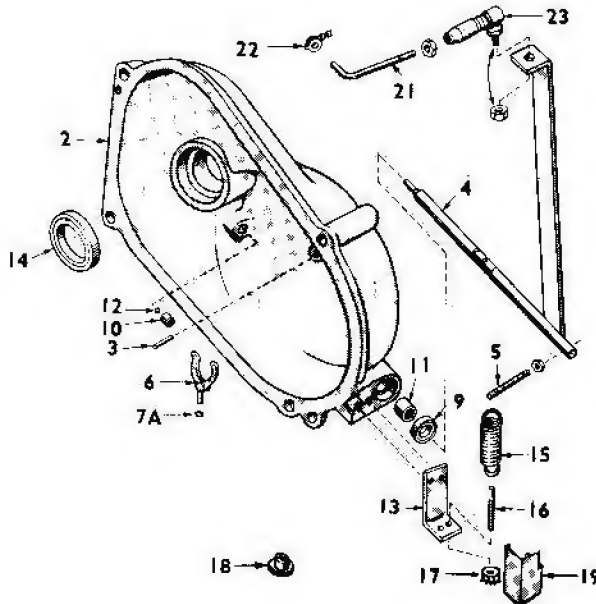
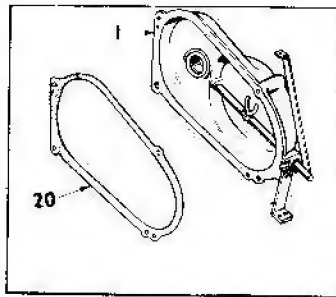
* - Parts in Cylinder Block Assembly.

VALVE AND BREATHER GROUP



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	110B828	1	Valve, Intake
2	110B827	1	Valve, Exh. Stellite
3	110A609	2	Spring, Valve
4	110A558	1	Retainer, Val Spg. - Int. (exhaust also for gas plants)
5	110A540	1	Rotocap, Valve - Exhaust (None on gas plants)
6	110A8	4	Lock, Val. Spg. Retainer
7	115A6	2	Tappet, Valve
8	110B840	1	Cover, Valve
9	110A832	1	Gasket, Valve Cover
10	123A486	1	Valve, Breather with 5/16" Ball
11	503A271	1	Hose, Breather, 7/16" x 5-1/4"
12	123A788	1	Baffle, Breather - Key 6,7 (PortaCharge Mdl.s.) Begin Serial #708811
	800-15	1	Screw, Cap (1/4-20 x 3") Valve Cover
	526-63	1	Washer, Copper, Valve Cover Screw

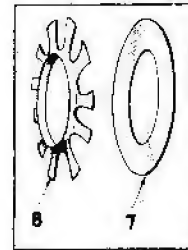
GEAR COVER GROUP



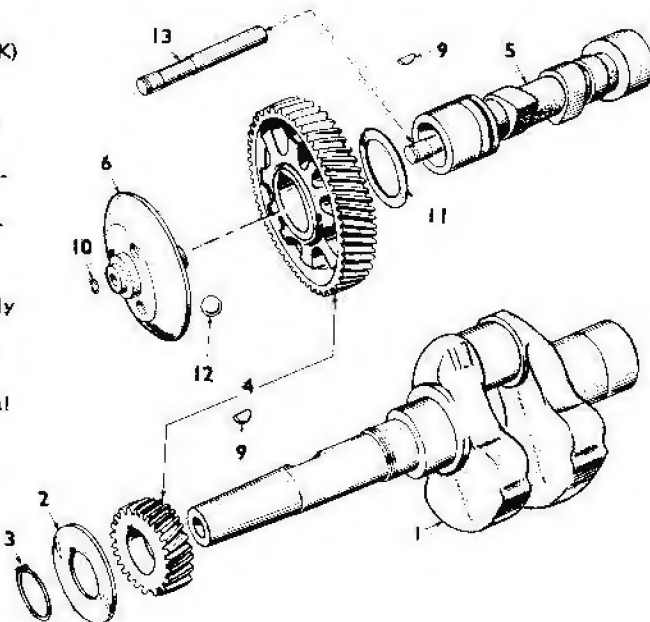
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	COVER ASSEMBLY, GEAR - INCL. PARTS MARKED *		
	103C141	1	To Spec H
	103C222	1	Begin Spec H
2	*COVER, GEAR - NOT SOLD SEPARATELY		
3	516-117	1	*Pin, Roll - 3/16 x 13/16" Gov. Cup Stop
4	*ARM AND SHAFT, GOVERNOR		
	150A575	1	To Spec H
	150A789	1	Begin Spec H
5	150A177	1	Stud, Gov. Sensitivity Adj.
6	150A620	1	*Yoke, Gov. Shaft - Incl. Retainer Ring 518-129 (Replaces 150A236)
7	526-140	1	Washer, Gov. Yoke (Not used on later models).
7A	518-129	1	*Ring, Gov. Yoke Retainer (Only Models with grooved Yoke)
8	516-36	1	Pin, Cotter, Gov. Yoke, 1/16 x 3/8" (Not used on later models)
9	509-8	1	*Seal, Oil - Gov. Shaft
10	510-8	1	*Bearing, Gov. Shaft - Lower
11	510-13	1	*Bearing, Gov. Shaft - Upper
12	510-14	1	*Ball, Gov. Shaft Thrust
13	150A156	1	*Bracket, Gov. Spring
14	509-12	1	*Seal, Crankshaft Oil, Front
15	150A98	1	Spring, Governor
16	150A213	1	Stud, Gov. Spring Tension Adj. (Replaces 150A96)
	NUT, GOV. ADJUSTING -		
17	870-131	1	Key 1,2,3,4,8,9,10 (small) Replaces 150A89
18	150A33	1	Key 5,6,7 (large)
19	150A198	1	Cover, Gov. Spring, to Spec H
20	103B13	1	Gasket, Gear Cover
21	LINK, GOVERNOR ARM TO CARBURETOR -		
	150A578	1	To Spec H
	150A786	1	Begin Spec H
22	518-4	1	Clip, Gov. Link to Carb.
23	150A639	1	Joint, Ball (Replaces 150A300)

* - Parts in Gear Cover Assembly.

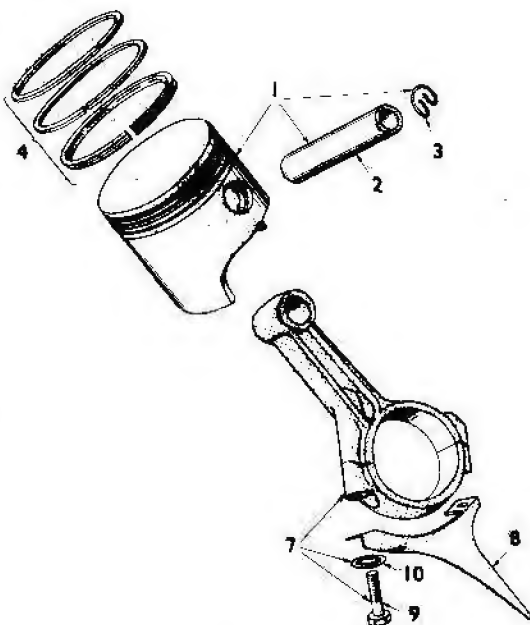
CRANKSHAFT, CAMSHAFT, GOVERNOR CUP GROUP



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	CRANKSHAFT		
	104C236	1	Key 1 through 6 and 10
	104C236	1	Key 7 (24-V, to Spec K, and All 32-V)
	104C265	1	Key 7 (24-V, Begin Spec K)
	104C265	1	Key 8, 9
2	104A50	1	Washer, Crank. Gear
3	518-12	1	Ring, Lock - Crank. Gear
4	105-235	1	Washer
			Gear Set, Timing (Crank. - Cam.), Cam. Gear Incl. Flyball Spacer & Plate - Replaces 105-71 (To Serial #668253)
5	105A139	1	Camshaft and Pin Assembly
6	150B612	1	Cup, Gov.
7	150A77	1	Plate, Gov. Ball, to Serial 668253
8	150B85	1	Spacer, Gov. Ball, to Serial 668253
9	515-1	2	Key, Gear
10	150A78	1	Ring, Lock - Cam. Center Pin
11	105A4	1	Washer, Cam. Thrust
12	BALL, GOVERNOR FLY		
	510-15	10	Key 1 through 7, and 10
	510-15	5	Key 8, 9
13	150A75	1	Pin, Camshaft Center



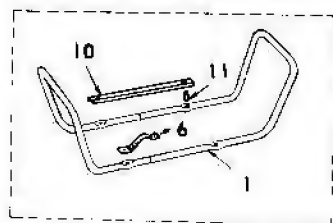
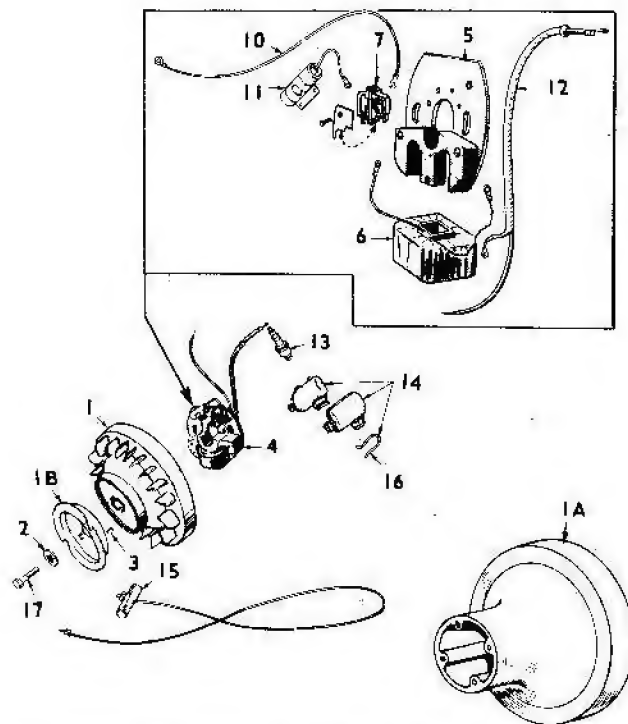
PISTON AND CONNECTING ROD GROUP



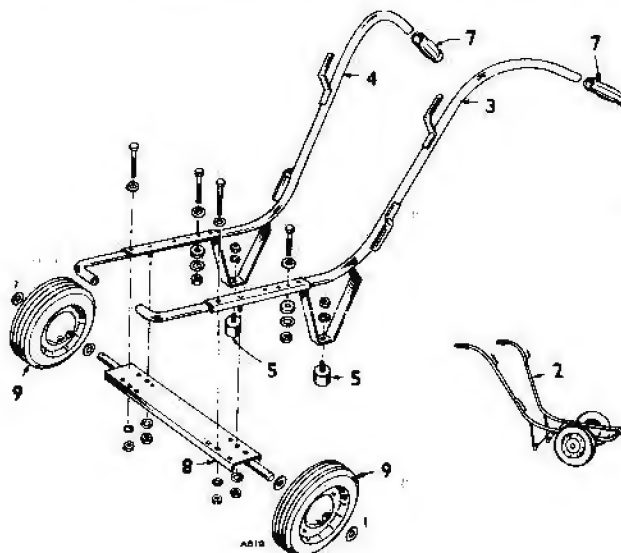
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	112A75	1	Piston & Pin Assembly - Specify: Std. or .010", .020", .030", .040" Over.
2	112A20	1	Pin, Specify Std. or .002" Over.
3	112A13	2	Ring, Retaining, Piston Pin
4	113-12	1	Ring Set - Specify: Std., .010", .020", .030", .040,, Over.
7	114C95	1	Rod, Specify Std., or .010", .020", .030". Under. (Replaces 114A85)
8	DIPPER		
	114A89	1	Key 1 through 6 and 10
	114A89	1	Key 7 (24-V) To Spec K
9	114A23	2	Screw Rod Cap (Hardened)
10	854-14	2	Washer, Lock (I.T. Shakeproof)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	FLYWHEEL, MAGNETO (Pressure Cooled Plants)		
	160C460	1	Key 8,9
	160C459	1	Key 1 through 7 and 10
1A	FLYWHEEL (Vacu-Flo Cooled Plants)		
	160C470	1	Key 1 through 7
	169C672	1	To Spec H
			Begin Spec H
			Key 8,9
	160C466	1	To Spec H
	160C729	1	Begin Spec H
1B	192B261	1	Sheave
2	526-141	1	Washer, Flywheel
3	515A113	1	Key, Flywheel
4	160A487	1	Backplate Assy., Magneto -
			Includes parts marked *
			(Replaces 160A448)
5	160A454	1	*Backplate and Pole shoe
6	160B155	1	*Coil
7	160K540	1	*Point Set (Replaces 160P456)
10	*LEAD, STOP		
	336A1025	1	Key 1,3,8,9,10
	336A345	1	Key 2,4,5,6,7
	312A33	1	*Condenser
12	167A1272	1	*Lead, Spark Plug
13	167-28	1	Plug, Spark
14	167A67	1	Shield & Clamp, Spark Plug
15	192A23	1	Rope & Handle, Man. Start.
16	167A64	1	Clamp, Spark Plug Shield
17	104A237	1	Screw, Flywheel Mounting

* - Parts in Magneto Backplate Assembly.



CARRYING FRAME AND DOLLY GROUP



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
NOTE: Dolly equipment is OPTIONAL for Plants with Key 1,3,8,10			
Dolly equipment is NOT designed for Portable Models (Key 9).			
1	FRAME, CARRYING - 403K365	1	Key 1,3,8,10 (Optional) - Includes Hardware

REF. NO.	PART NO.	QTY. NO.	PART DESCRIPTION
	403B455	1	Key 9 (Std. Equip.) Complete assembly with mtg. cushions, channel, supports, etc. Replaces 403A388 & 403A389
2	410C219	1	Dolly, Complete (2 Wheel) Includes parts marked * plus hardware
3	410D216	1	*Base and Handle, Right, Less Grip
4	410D215	1	*Base and Handle, Left, Less Grip (Carb. Side)

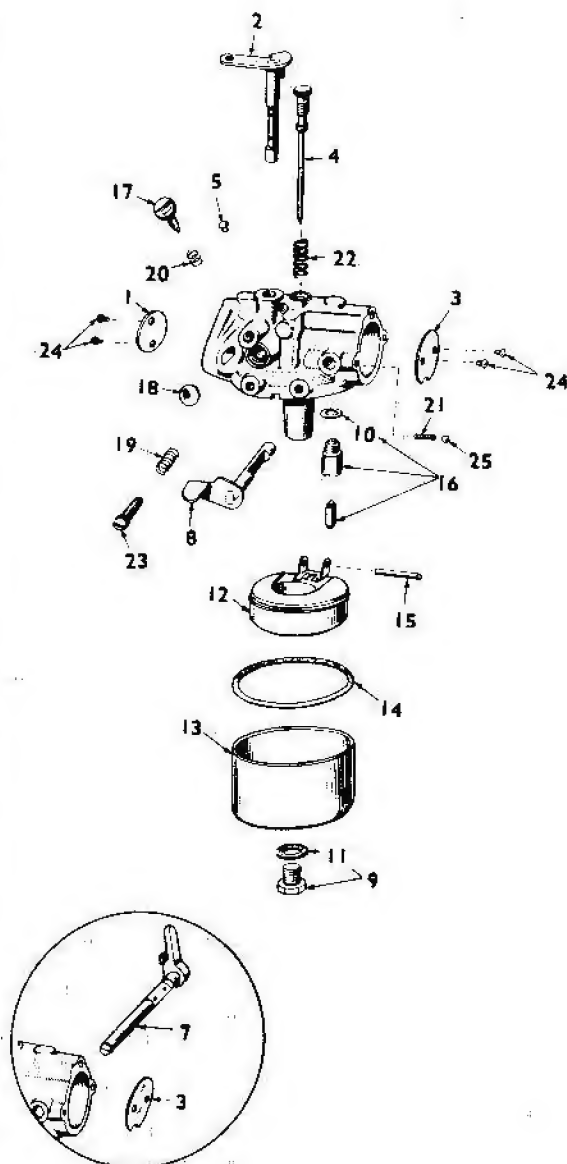
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
5	402A40	2	*Cushion, Rubber
6	STRAP (GROUND) BLOWER HOUSING TO CARRY-- ING FRAME *		
	337A44	1	Key 1,3,8,10 (6" Long) Opt. Equip.
	337A51	1	Key 9 (3" Long) Std. Equip.
7	403-205	2	*Grip, Rubber
8	410B222	1	*Axle
9	410P223	2	*Wheel and Tire, 10 x 2.50"
10	402A170	2	**Channel, Eng. Mtg. (Only with 403B455 Carrying Frame Key 9)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
11	402A171	4	*Support, Eng. Mtg. Channel (Only with 402B455 Carry- ing Frame, Key 9)
	403K174	1	Bracket Kit, Quick Release. (Accessory for use with Carrying Frame) Not illus.

* - Parts in Dolly Assembly.

** - Two types of Carrying Frames were used. (a) Obsolete type 403A388 and 403A389 had ROUND mounting holes in the frame and used CAPSCREWS: (b) Superseding type 403B455 has SQUARE mounting holes in the under-side of the frame for CARRIAGE BOLTS and uses (2) Engine Mounting Channels 402A170 and (4) Channel Support 402A171.

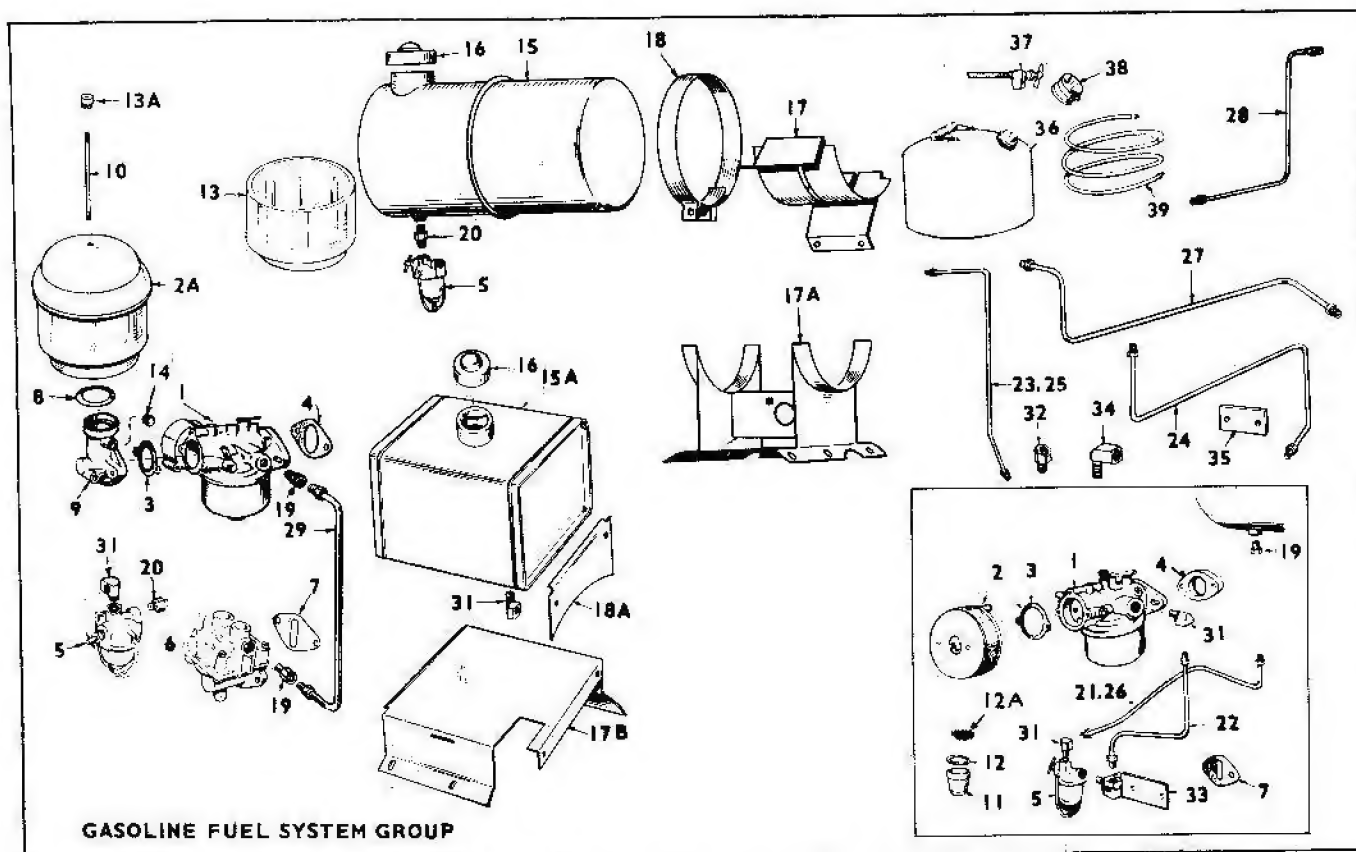
GASOLINE CARBURETOR PARTS GROUP



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	CARBURETOR, GASOLINE		
	143B73	1	Key 8,9,10 (Man. Choke 5/8" Venturi)
	143B66	1	Key 1,3,5,6,7 (Man. Choke, 1/2" Venturi)
	143B68	1	Key 2,4 (Elec. Choke, 1/2" Venturi)
	143K81	1	Parts Kit, Carb. Includes parts marked * and **
	143K80	1	**Gasket Kit, Carburetor Includes parts marked *
	145A110	1	*Gasket, Spacing, Carb. Flange (Illustrated in Fuel System Group)
1	143-97	1	Valve, Throttle
2	143-98	1	Shaft and Lever, Throttle
3	VALVE, CHOKE		
	143-99	1	Key 2,4 (Elec. Choke)
	143-267	1	Key 1,3,5,6,7,8,9,10 (Man. Choke) - Replaces 143-99
4	143-78	1	** Needle, Idle Jet & High Spd.
5	143-30	1	Plug, Idle Passage
7	143-100	1	Shaft and Weight, Choke, Key 2,4
8	143-101	1	Shaft and Lever, Choke, Key 1,3,5,6,7,8,9,10
9	143-118	1	Screw and Gasket, Bowl
10	143A15	1	*Gasket, Fuel Inlet Valve
11	143-36	1	*Gasket, Bowl Screw
12	143-105	1	Float
13	143-106	1	Bowl
14	143-77	1	*Gasket, Bowl Ring
15	143-212	1	Pin, Float (Replaces 143-107)
16	143-39	1	** Valve, Fuel In.
17	143-109	1	Screw, Idle Adj.
18	143-110	1	Plug, Welch
19	143-111	1	Spring, Throttle Lever Adj. Screw
20	143-112	1	Spring, Idle Adj. Screw
21	143-113	1	Spring, Choke Shaft, Key 1,3,5,6,7,8,9,10
22	143-114	1	Spring, High Speed Adj. Needle
23	143-115	1	Screw, Throttle Lever Adj.
24	812-14	4	**Screw, 3-48 x 3/16, Choke & Throttle Valve Attaching
25	143-117	1	Ball, Choke Shaft, Key 1,3 5,6,7,8,9,10

* - Parts in Gasket Kit.

* & ** - Parts in Repair Kit.



NOTE: Fuel system parts are listed in sub groups according to type of fuel tank.
Use STANDARD PARTS with all Parts Key Nos. unless specified otherwise.

REF. NO.	PART NO.	QTY. NO.	PART DESCRIPTION
1	CARBURETOR -		
	143B66	1	Key 1,3,5,6,7
	143B68	1	Key 2,4
	143B73	1	Key 8,9,10
	CLEANER, AIR -		
2	140A369	1	Dry Type, Complete, to Serial 566319
2A	140B441	1	Oil Bath Type - Begin Serial 566319 (Opt. Prior to cut-off)
3	145A111	1	Gasket, Air Cleaner, Adapter to Carb.
4	145A110	1	Gasket, Spacing - Carb. Flange
5	149B79	1	Filter
6	149D693	1	Pump, Replaces 149C559 or 149D687
7	149A3	1	Gasket, Pump Mounting
8	140A443	1	Gasket, Oil Bath to Adapter Begin Serial 566319
9	140A446	1	Adapter, Oil Bath, Begin Serial 566319
10	520A538	1	Stud, Air Cleaner to Adapter 3/16" x 7-3/8" - Begin Serial 566319
11	149-150	1	Bowl
12	149A149	1	Gasket
12A	149-202	1	Screen
13	140B649	1	Cup, Oil Bath, Plastic, Begin Serial 566319 (Incl. Gasket)
13A	140P587	1	Knob, Plastic - Oil Bath Mtg. - Begin Serial 566319
14	505-1	1	Cap, Pipe, 1/8" Air Cleaner Adapter, Key 6,7 (24-V Output) Begin Serial 708811
19	502-3	2	Connector (1) Carb. In. (1) Pump Out.
20	502-82	1	nipple, Filter Mtg.

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
29	149A561	1	Line, Fuel
31	502-2	1	Elbow, Filter Inlet
PLANTS WITH FUEL TANK MOUNTED OVER GENERATOR -			
15A	TANK, FUEL		
	159B234	1	Key 3,10, Begin Spec H (2 Gal.)
	159B722	1	Key 1,8,9 Begin Spec H (1.3 Gal.)
16	159A7	1	Cap (Replaces 159A80)
	BRACKET, MOUNTING -		
17A	159C623	1	Key 1,3,8,9,10 Spec F through G
17B	159A717	1	Key 3,10 Begin Spec H
17B	159D721	1	Key 1,8,9 Begin Spec H
18A	159B718	1	Bracket, Key 1,3,8,9,10 Begin Spec H
19	CONNECTOR, INVERTED- 1/4" TUBE x 1/8" PIPE		
			Models WITHOUT Fuel Pump
	502-3	1	Tank Outlet - Spec A Only
	502-3	1	Filter Outlet - Spec E through G
			Models WITH Fuel Pump
	502-3	2	Fuel Pump Outlet or Carb. Inlet
	502-3	1	Tank Outlet, To Spec E
	502-3	1	Filter Outlet, Spec E Through G
	502-3	1	Filter Inlet, Key 1,3,8,9,10 Begin Spec H
	LINE, FUEL - MODELS WITHOUT FUEL PUMP		
21	159B504	1	Spec A, Tank Outlet to Filter
22	149A588	1	Spec A, Models Only
23	159B538	1	Spec B through D, Filter to Carb.
24	159C633	1	Spec E through G, Filter to Carb.
25	159B538	1	Begin Spec H, Filter to Carb. Key 6

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	LINE, FUEL - MODELS WITH FUEL PUMP		
26	159B504	1	To Spec E, Tank to Filter
27	159B637	1	Spec E through G, Filter to Pump
28		1	Begin Spec H, Tank to Filter Key 3, 10
	159A728	1	Key 1, 8, 9
	159A727	1	All Specs, Fuel Pump to Carb.
29	149A561	1	
31	ELBOW, INVERTED - 1/4" TUBE X 1/8" PIPE		
	Models WITH Fuel Pump		
	502-2	1	Filter Inlet, to Spec E
	502-2	1	Tank Outlet Begin Spec H
	Models WITHOUT Fuel Pump		
	502-2	1	Filter Inlet, Spec A Only
	502-2	1	Carburetor Inlet
32	502-65	1	Filter Outlet, 45°, Spec B through D and Begin Spec H Key 6 Models
33	149A254	1	Bracket & Elbow - Fuel Filter Mtg.
35	149A136	1	Cover, Fuel Pump Mtg. Hole (Mdl's. W/O Pump)

PLANTS WITH FUEL TANK (5-GAL.) NOT MOUNTED (SEPARATE FROM PLANT)

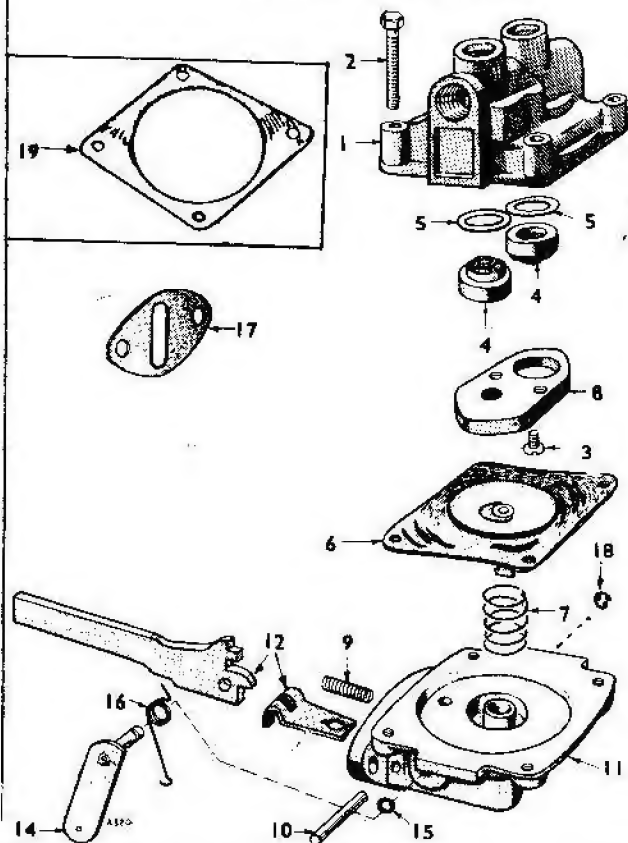
19	502-3	2	Connector, Inverted, Carb. In. & Fuel Pump Out., Key 4
20	502-82	1	Nipple, Pipe 1/8" Filter Mtg. Key 4
22	149A588	1	Line, Fuel (Filter Brkt. to Carb.) Key 2, 7

REF. NO.	PART NO.	QTY. NO.	PART DESCRIPTION
29	149A561	1	Line, Fuel (Fuel Pump to Carb.) Key 4.
31	502-2	1	Elbow, Inverted Male Carb. In.
33	149A254	1	Bracket & Elbow, Filter Mtg. Key 2, 7
34	502-20	1	Elbow, Street, 1/8" Pipe, Filter In.
36	415A126	1	Tank, 5-Gal. (Replaces other 5-Gal. Separate Tanks)
37	504A13	1	Valve, Shut-off, with Strainer Mounts in 1/8" Pipe Thread Bottom Tank Outlet
38	415B124	1	Cap, Rubber (Provision for Inserting Fuel Line)
39	501A27	1	Line, Flexible, Tank to Filter, 48" with Swivel at One End, 1/8" Pipe at Other End. Remove fitting to install through cap.

ROUND FUEL TANK (1.4 GAL.) MOUNTED ON SIDE OF ENGINE

15	159B488	1	Tank, Key 6 (Also Key 1, 3, 5, 8, 9, 10 To Spec H)
16	159A7	1	Cap. (Replaces 159A80)
17	159C486	1	Bracket, Tank Mtg., Key 5 (Also Key 1, 3, 8, 9, 10 to Spec E)
18	159A154	2	Band Tank Mounting
19	502-3	1	Connector, Tank Outlet
21	159B504	1	Line, Tank to Filter

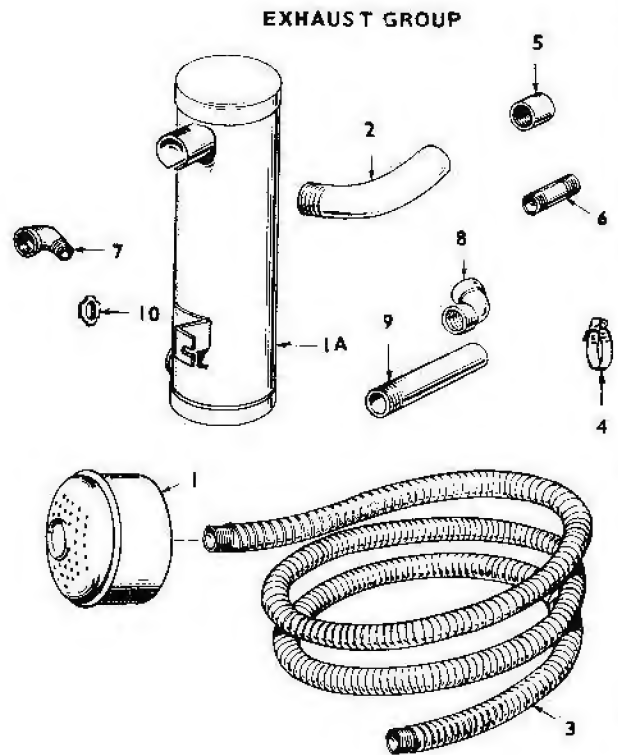
FUEL PUMP PARTS GROUP



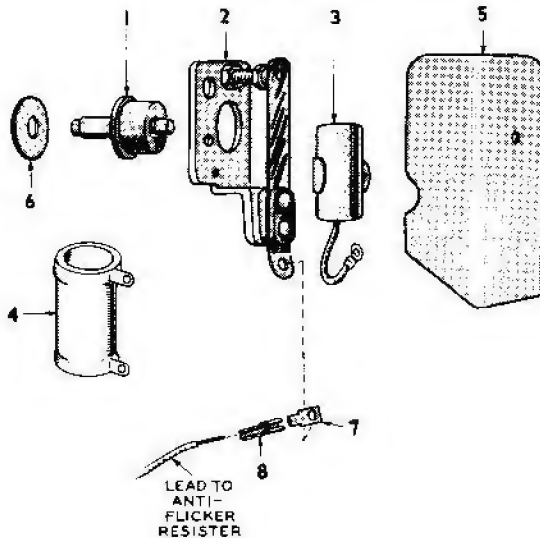
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	149D693	1	Pump, Fuel (Illustrated in Fuel System Group) Replaces 149C559 or 149C687
	149K526	1	Repair Parts Kit, Inc's. parts marked *
1		1	Body, Not Sold Separately
2	815-148	4	Screw, Self Tapping, #8-32 x 7/8"
3	815-147	2	Screw, Phillips Self Tapping, #6-32 x 5/8", Valve Retainer
4	149-96	2	* Valve and Cage.
5	149A95	2	* Gasket, Valve.
6	149A582	1	* Diaphragm Assembly.
7	149A672	1	* Spring, Replaces 149A93.
8	149A539	1	Retainer, Valve Cage
9	149A675	1	* Spring, Replaces 149A94
10	516A113	1	Pin, Rocker Arm.
11		1	Body, Not Sold Separately
12	149-710	1	Link and Arm, Rocker, (only as a set)
14	149A551	1	Lever, Primer
15	509-65	2	Seal, "O" Ring
16	149A404	1	Spring, Primer Lever
17	149A3	1	* Gasket, Pump Mounting
18	518-129	1	Ring, Retainer, Primer Lever
19	149A858	1	* Gasket, Diaphragm - Lower Side.

* - Parts in Repair Kit.

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	MUFFLER, EXHAUST - TO SPEC H WITH FEMALE PIPE THREAD, TO REPLACE MALE THREAD MUFFLER, USE #505-332 NIPPLE		
	155B488	1	Key 1 through 7 and 10
	155B487	1	Key 8,9
1A	MUFFLER, EXHAUST - BEGIN SPEC H -		
	155D692	1	For Pressure Cooled Models
	155C696	1	For Vacu-Flo Cooled Models
2	155A691	1	Tube, Muffler, Exh. Pressure Cooled Models Begin Spec H
3	TUBE, EXH., FLEXIBLE		
	155B490	1	To Spec H, Key 2,4,7
	155B727	1	Begin Spec H, Key 2,4,6,7,8
4	503-189	1	Clamp, Muffler, Begin Spec H
5	505-29	1	Coupling, Exh. Pipe 3/4", Vacu-Flo Cooled Models to Spec H
6	NIPPLE, PIPE, EXHAUST - TO SPEC H		
	505-332	1	For Pressure Cooled Models
	505-165	1	For Vacu-Flo Models
6	NIPPLE, PIPE, EXHAUST - BEGIN SPEC H		
	505-102	1	For Vacu-Flo Models.
7	505-51	1	Elbow, Street, 3/4" x 90° To Spec H
8	505-132	1	Elbow, Pipe, 3/4" x 90° Exh. Vacu-Flo Models To Spec H
9	505-431	1	Nipple, Pipe Half, 3/4" Begin Spec H, Vacu-Flo Cooled Models
10	331-38	1	Locknut, Chase, 3/4", Exh.



ANTI-FLICKER GROUP



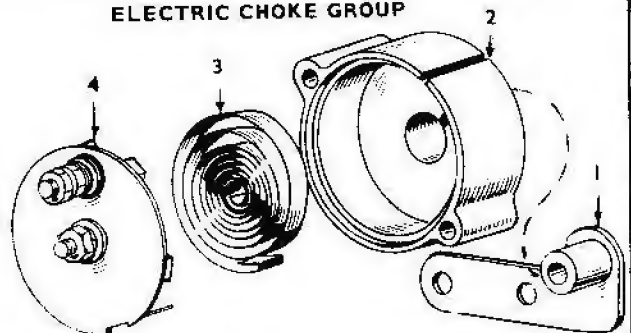
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	160A447	1	Plunger Assembly (Plunger, Guide, Diaphragm). Gasket #160A461 not included.
2	160B478	1	Point Set
3	312A19	1	Condenser, 0.5 Mfd.
4	RESISTOR, FIXED (MOUNTED IN GEN.) LISTED ALSO IN GENERATOR GROUP -		
			Key 1,2.
	304A250	1	50-Cy. Plants To Spec H
	304A315	1	60-Cy. Plants To Spec H
	304A491	1	60-Cy. Plants, Begin Spec H
			Key 3,4
	304-321	1	To Spec H
	304A168	1	Begin Spec H
	304A159	1	Key 10, To Spec H (Adjustable)
5	166A254	1	Cover, Contact Points
6	160A461	1	Gasket, Plunger Guide
7	332A527	1	Terminal, Solderless, Male
8	332A529	1	Terminal, Solderless, Female
	815-187	1	Screw, Self Tapping, #10-32 x 1-1/4" Cover Mounting
	304A304	1	Bracket, Resistor Mounting (Listed also in Gen. Group)
	304A14	2	Washer, Resistor Centering, 9/16 O.D. (Listed also in Generator Group)

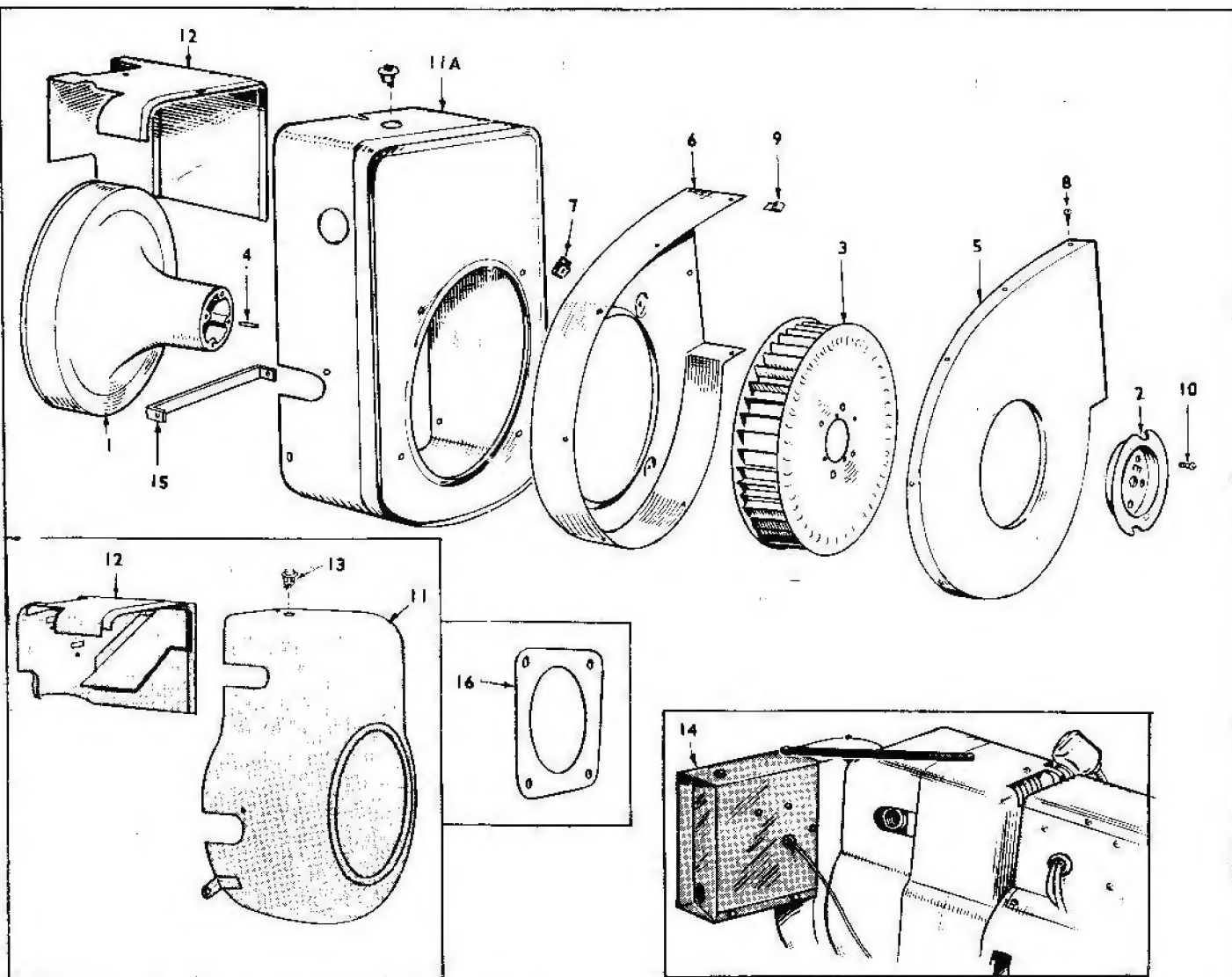
ELECTRIC CHOKE GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
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For Gasoline Fuel Plants with Key 2, and 4.

1	153A196	1	Adapter, Choke-to-Carburetor.
2	153A58	1	Bracket Housing.
3	153A17	1	Element, Bimetal
4	153A114	1	Cover Assembly, Includes 24-V Element,



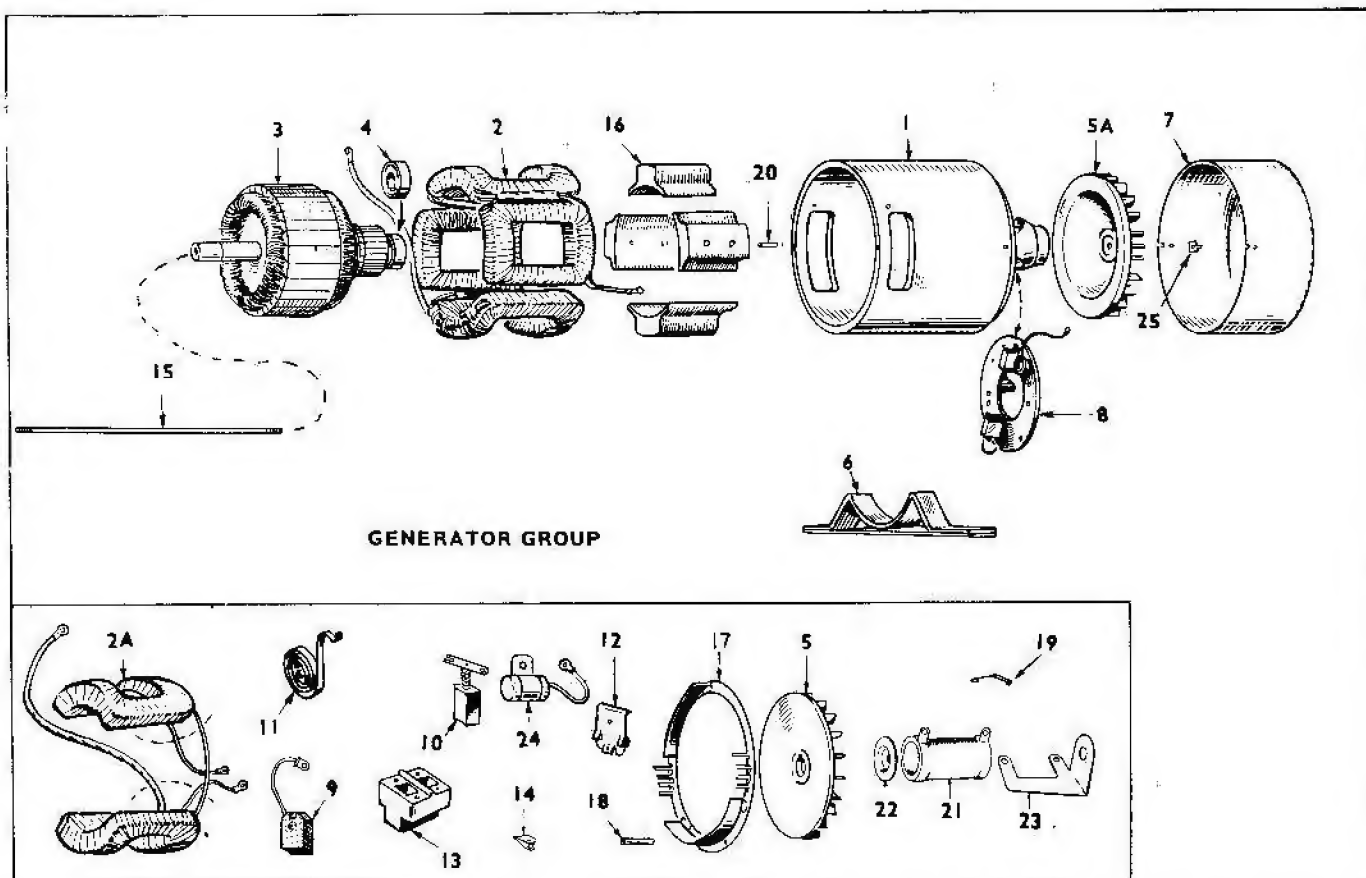


AIR HOUSING & VACU-FLO COOLING GROUP

The letter V appears in the MODEL NO. of Vacu-Flo cooled plants (Vacu-Flo is a factory installed option)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	FLYWHEEL, MAGNETO, VACU-FLO PLANTS		Key 1 through 7
	160C470	1	To Spec H
	160C672	1	Begin Spec H
			Key 8,9
	160C466	1	To Spec H
	160C729	1	Begin Spec H
2	192B261	1	Sheave Rope
3	134C563	1	Wheel, Blower, (Vacu-Flo Plants)
4	516-91	2	Pin Groove, Sheave & Blower Wheel-to-Flywheel, (Vacu-Flo Plants)
5	134D570	1	Scroll, Air, Front, (Vacu-Flo Plants)
6	SCROLL, AIR, REAR (VACU-FLO PLANTS)		
	134D571	1	To Spec H
	134D1015	1	Begin Spec H
7	NUT, SPEED, U-TYPE, SCROLL-TO-BLOWER HOUSING (VACU-FLO PLANTS)		
	870-119	3	To Spec H
	870-126	3	Begin Spec H
8	809-43	11	Screw, Sheet Metal, #10 x 3/8"
			Scroll (Vacu-Flo Plants)
9	870-120	8	Nut, Speed, J-Type Scroll, (Vacu-Flo Plants)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
10	812-150	2	Screw, Round Head, 1/4-20 x 5/8", Sheave & Blower (Vacu-Flo Plants)
	HOUSING, BLOWER -		
			To Spec H
11	134D519	1	Pressure Cooled
	134D609	1	Vacu-Flo Cooled
			Begin Spec H
11A	134D1016	1	Pressure Cooled
	134D1101	1	Vacu-Flo Cooled (Replaces 134D1017)
12	SHROUD, CYLINDER AIR		
			To Spec G
	134C518	1	Key 3,4,5,8,9,10
	134C549	1	Key 1,2,6,7
			Begin Spec G
	134D1018	1	Key 3,4,7,8,9,10
	134D1042	1	Key 1,2
	134A1074	1	Key 6
13	313-18	1	Button, Stop, Key 1,3,8,9,10
14	134K955	1	Shutter Kit, Air Discharge (Automatic) OPTIONAL ACCESSORY for All Unhds. (Vacu-Flo Plants) & Hsd. Beginning 2/1/59
15	134A1014	1	Bracket, Blower Housing Mtg. Begin Spec H
16	134A1438	1	Plate, Air Restriction, Key 3, 24-V Output, (PortaCharge Models)



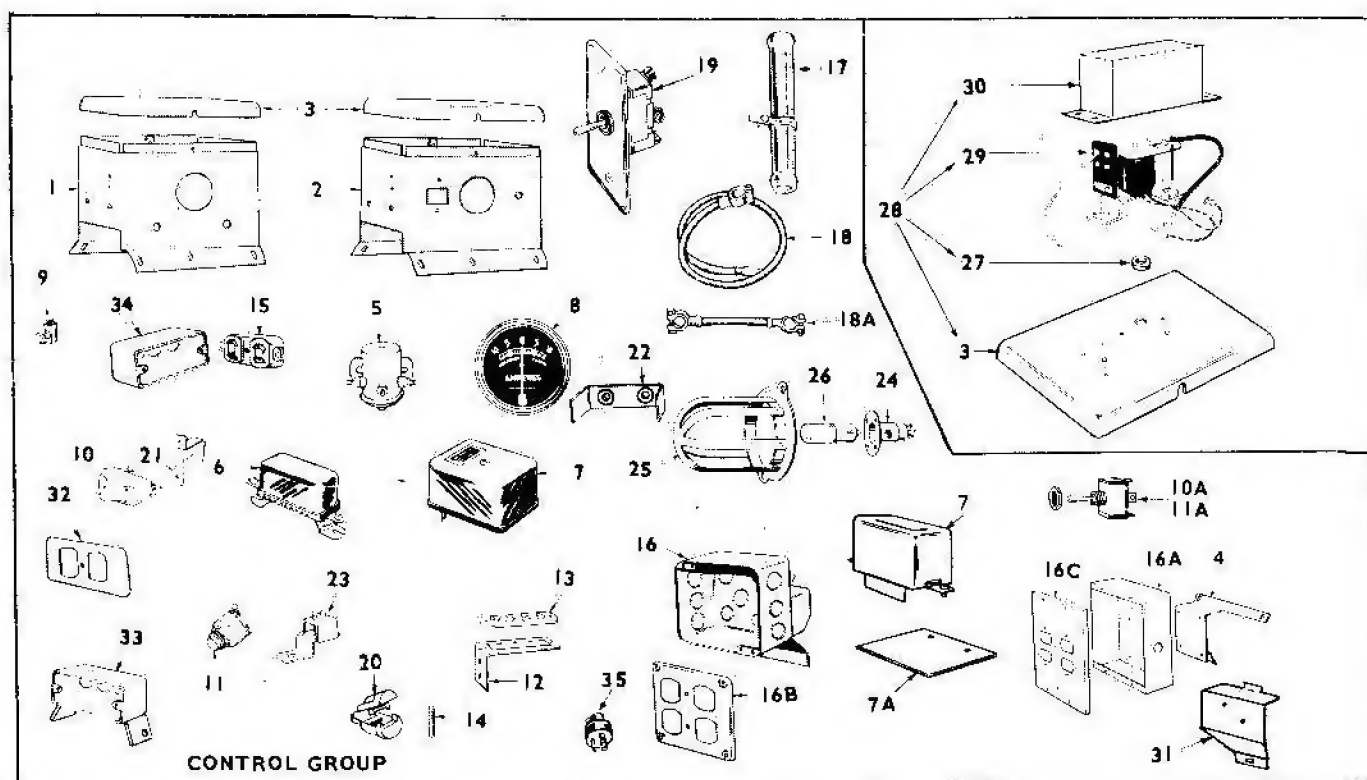
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	**	1	Frame, Machined & Drilled (less coils & Poleshoes)
2	COIL SET (Set of 4 Coils Wired Together)		Key 1
	222A1405	1	To Spec H
	222A1578	1	Begin Spec H
			Key 2
	222A1404	1	To Spec H
	222A1577	1	Begin Spec H
			Key 3
	222A1407	1	To Spec H
	222A1574	1	Begin Spec H
			Key 4
	222A1400	1	To Spec H
	222A1573	1	Begin Spec H
	222A1415	1	Key 5
			Key 6
	222A1408	1	12-V
	222A1476	1	24-V
			Key 7, 24-V
	222A1476	1	To Spec J
	222A1606	1	Begin Spec J
			Key 7, 32-V
	222A1410	1	Spec A Only
	222A1450	1	Begin Spec B
			Key 10
	222A1525	1	To Spec H
	222A1583	1	Begin Spec H
2A	222A1439	1	Coil Set (Set of 2 Coils Wired Together) Key 8,9
3	ARMATURE		Key 1,2
	201A687	1	120-V, Spec A
	201A796	1	120-V, Spec B through G
	201A1081	1	120-V, Begin Spec H
	201A722	1	240-V, Spec A
	201A797	1	240-V, Spec B through G
	201A1081	1	240-V, Begin Spec H

** - Order by Part Description - Give Complete Plant Model and Serial Number.

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
			Key 3,4 (Includes Bearing)
	201A677	1	120-V, To Spec H
	201A1072	1	120-V, Begin Spec H
	201A721	1	240-V, To Spec H
	201A1073	1	240-V, Begin Spec H
	201A698	1	Key 5 (Includes Bearing)
			Key 6
	201A690	1	12-V, Spec A
	201A794	1	12-V, Begin Spec B
	201A841	1	24-V
			Key 7
	201A841	1	24-V, To Spec J
	201A1188	1	24-V, Begin Spec J
	201A692	1	32-V, Spec A
	201A793	1	32-V, Begin Spec B
			Key 8,9 (Includes Bearing)
	201A801	1	120-V, 50-Cy
	201A765	1	120-V, 60-Cy
	201A822	1	240-V, 50-Cy
	201A776	1	240-V, 60-Cy
			Key 10
	201A929	1	To Spec H
	201A1075	1	Begin Spec H
4	510A47	1	Bearing, Ball, Armature, Key 3,4,5,8,9,10
5	205B47	1	Blower, Armature, Engine End, Key 3,4,5, To Spec H
5A	205B56	1	Blower, Armature, Brush Rig End, Key 8,9,10 (Also Key 6,7 Begin Spec B, Key 3,4 Begin Spec H)
6	232B1282	1	Bracket, Gen. Support, Key 9
7	COVER, GENERATOR END		To Spec F
	232C1214	1	Key 1,2,3,4,5
	232C1214	1	Key 6,7, Spec A Only
	234C4	1	Key 6,7,8,9, Spec B through E
			Spec F & G
	234C41	1	Key 1,2,3,4,5
	234C34	1	Key 6,7,8,9,10

REF. NO.	PART NO.	QTY. NO.	PART DESCRIPTION
			Begin Spec H
	234C125	1	Key 1,2
	234C127	1	Key 3,4,6,7,8,9,10
8	RIG ASSEMBLY, BRUSH - INCLUDES BRUSHES AND SPRINGS		
			Key 1,2
	212C212	1	To Spec H
	212C265	1	Begin Spec H
	212C209	1	Key 3,4
	212C226	1	Key 5 (Replaces 212C220)
			Key 6,7
	212C214	1	Spec A Only
	212C228	1	Spec B through E
	212C253	1	Begin Spec F
	212C215	1	Key 8,9
	212C245	1	Key 10
9	BRUSH COMMUTATOR		
	214A41	4	Key 1,2,3,4
	214A58	4	Key 5
			Key 6,7
	214A12	4	Spec A Only
	214A44	4	Begin Spec B
	214A1	2	Key 8,9
	214A39	4	Key 10
10	BRUSH, COLLECTOR RING		
	214A21	2	Key 1,2 (Includes Spring)
	214A59	4	Key 3,4,8,9, (Includes Spring)
			Replaces 214A35
	SPRING, COMMUTATOR BRUSH		
11	212A1003	4	Key 1,2,3,4,10 (NOTE: Key 8,9 qty. is 2)
			Key 6,7
11	212A1003	4	Spec A Only
12	212A1105	4	Begin Spec B
12	212A1106	4	Key 5
13	BLOCK, GUIDE, COLLECTOR RING BRUSH		
	212A1041		Key 1,2
	212A1041		Key 1,2
	212A1064		Key 3,4,8,9
14	CLIP, RETAINER, COLLECTOR RING BRUSH		
	212A1042	1	Inner Brush
	212A1045	1	Outer Brush

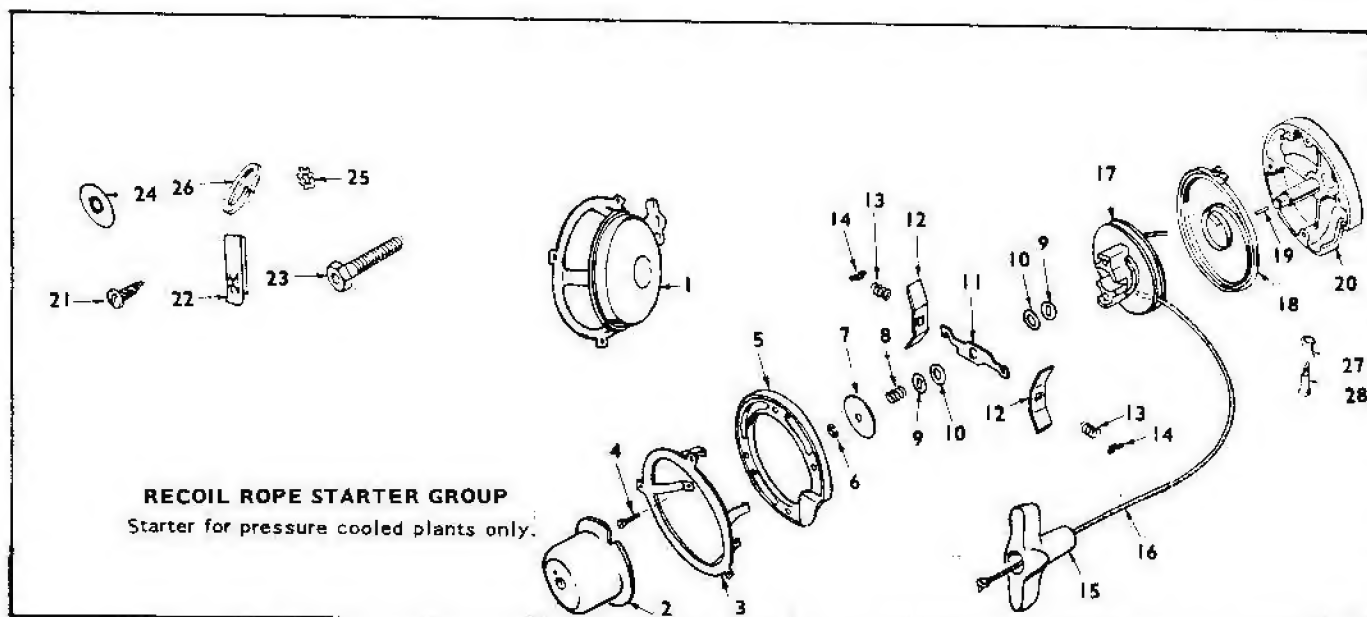
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
15	STUD, ARMATURE		
			Key 1,2
	520A385	1	Spec A Only
	520A510	1	Begin Spec B
			Key 3,4
	520A274	1	To Spec H
	520A56	1	Begin Spec H
	520A519	1	Key 5
			Key 6,7
	520A512	1	Spec A Only
	520A529	1	Spec B through E
	520A571	1	Begin Spec F
			Key 8,9
	520A265	1	To Spec H
	520A572	1	Begin Spec H
			Key 10
	520A578	1	To Spec H
	520A56	1	Begin Spec H
16	SHOE, POLE		
	221A111	4	Key 1,2,5,6,7
	221B110	4	Key 3,4
	221A115	2	Key 8,9
	221B125	4	Key 10
17	234B7	1	Scroll, Gen. Air, Key 3,4,5, To Spec H
18	232A1197	2	Spacer, Scroll Mtg., Key 3,4,5 To Spec H
19	232A596	1	Clip, Armature Brg. Stop, Key 5
20	520A363	2	Stud, Gen. Frame to Engine
21	RESISTOR, FIXED - ANTI-FLICKER (Listed in Anti-Flicker Group Also)		
			Key 1,2 - 60-Cy
	304A250	1	50-Cy Plants, To Spec H
	304A315	1	60-Cy Plants, To Spec H
	304-491	1	60-Cy Plants, Begin Spec H
			Key 3,4
	304-321	1	To Spec H
	304-168	1	Begin Spec H
	304-459	1	Key 10, To Spec H
22	304A14	2	Washer, Centering - Resistor Mtg. - Key 3,4 (Also Key 10, To Spec H)
23	304A304	1	Bracket, Resistor Mtg. - Key 3,4 (Also Key 10, To Spec H)
24	312A17	1	Condenser, Commutator Brush
24	312A58	1	Condenser, Collector Ring
25	232A1362	2	Clip, End Bell Cover, Begin Spec H



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY.	PART DESCRIPTION
						NO.	
							SWITCH, START-STOP KEY 2,4
				10	308-90	1	To Spec H (Use 308A166 to replace)
				10A	308P154	1	Begin Spec H
							SWITCH, START OR STOP, KEY 3
				11	308A29	2	To Spec H
				11A	308-155	2	Begin Spec H
				12	332A198	1	Bracket, Terminal Block, Key 2,4,5,6,7
				13	332A222	1	Block, Terminal, Key 2,4,5,6,7
				14	332A125	1	Stud, Brass, 1/4-20 x 1-3/4", Key 5,6,7, To Spec H
				15			RECEPTACLE, DUPLEX
					323P48	1	Key 1,3,8,9, Spec A (2-Prong)
							Key 1,3,8,9,10, Begin Spec B
					323P184	As Req.	120-V, 3-Prong (2 Parallel Blades, 1 Grounding Pin)
					323-213	As Req.	240-V, 3-Prong (2 Tandem Blades, 1 Grounding Pin)
							BOX, RECEPTACLE
				16	330B43	1	Key 9, To Spec C & Key 10 To Spec H
				16A	301C1373	1	Key 8,9, Spec C through G
				16A	330-28	1	Key 8,9,10, Begin Spec H
							COVER, RECEPTACLE BOX
				16B	330-42	1	Key 10, Key 9 (To Spec C & Begin Spec H), Key 8 (Begin Spec H)
				16C	301B1392	1	Key 8,9, Spec C through G
				17			RESISTOR, CHARGE, ADJUSTABLE, KEY 2,4
					304-66	1	10-Ohm, 50-Watt, 3/4 x 4" To Spec H
					304A268	1	5-Ohm, 50-Watt, 3/4 x 4" Begin Spec H
				18	416A77	2	Cable, Battery, 28", Key 2,4
				18A	416A4	1	Cable, Battery Jumper, 6-3/4" Key 2,4
				19	308A165	As Req.	Switch & Plate, Remote Start Stop (Optional) Key 2,4
				20	508-98	1	Bushing, Insulating, Load Cond. (Replaces 331-27) Key 1,3,8,9
1			BOX ONLY, CONTROL				
	301D1127	1	Key 5 (Also Key 6 To Spec G)				
	301D1128	1	Key 7, To Spec H (Also Key 6, Spec G Only)				
2	301D1868	1	Key 6,7, Begin Spec H				
			Key 2,4				
	301D1059	1	To Spec H				
	301D1859	1	Begin Spec H				
	301D2233	1	Key 7 (Onan PortaCharge Models Only)				
3			COVER, CONTROL BOX				
	301B1060	1	Key 2,5,6,7, To Spec H (Also Key 4 with no load transfer)				
	301B1492	1	Key 4 (With Load Transfer Control Only)				
	301C1858	1	Key 2,4,6,7, Begin Spec H				
			BRACKET, RECEPTACLE BOX				
	301C1204	1	Key 8,9, Spec C through G				
4			SWITCH, START SOLENOID				
5	307B40	1	Key 2,4,5 (Key 6 - 12-V)				
	307B61	1	Key 7 (Key 6 - 24-V)				
5	307B61	1	Switch, Solenoid, Charge (Key 7, PortaCharge Models Only)				
			RELAY, REVERSE CURRENT				
6	307B180	1	Key 2,4				
7	307B145	1	Key 5				
7	307B278	1	Key 6,7 (24-V Models)				
7	307B496	1	Key 7 (32-V Models) Replaces 307B185				
7	307B144	1	Key 6, Spec G (12-V Models)				
7A	307B495	1	Key 6, Begin Spec G (12-V Models)				
7B	301B592	1	Insulatpr, Key 7, (Also Key 6, Begin Spec G)				
8			AMMETER, CHARGE				
	302A58	1	Key 2,4				
	302A64	1	Key 5				
	302A62	1	Key 6 (12-V)				
	302-61	1	Key 7, Also Key 6, 24-V				
9	308-2	1	Switch, Hi-Lo Charge Rate Key 2				

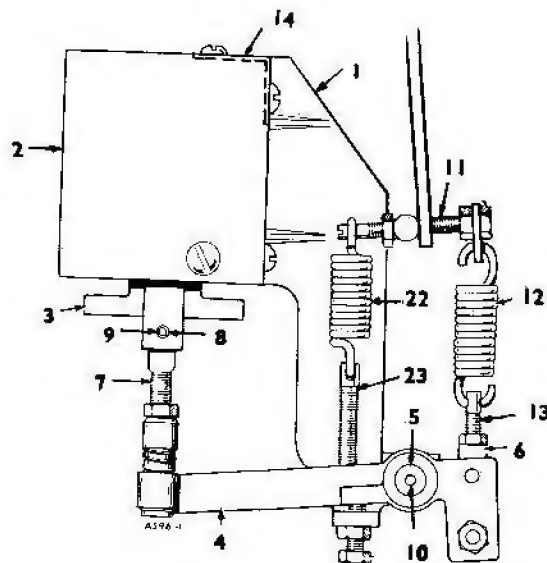
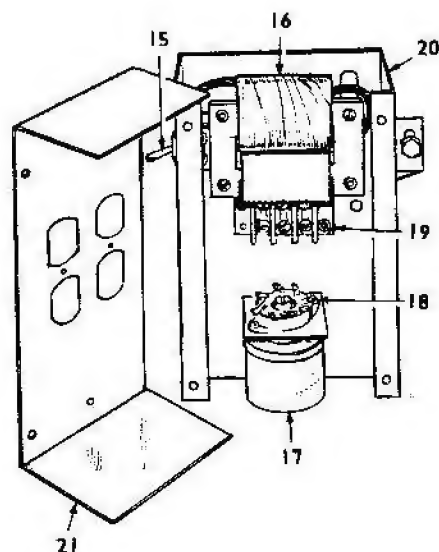
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
21	301A974	1	Bracket, Start-Stop Switch Key 2,4, To Spec H (Use with 308-90 Switch)
22	302P270	1	Bracket, Meter, Key 2,4,5,6,7
23	332-142	1	Terminal, Solderless, Plt. Grd., Key 1,2,3,4,8,9
24	322-21	1	Receptacle, Pilot Light, Key 8,9, Spec C through G
25	322A22	1	Guard, Pilot, Key 8,9, Spec C through G
26	BULB, PILOT LIGHT, KEY 8,9		
	322-59	1	240-V, Spec C through G
	322-11	1	120-V, Spec C through G
27	508A2	1	Grommet, Start-Disconnect Relay Cover, Key 4, To Spec H (Use with Load Transfer Only)
28	300C224	1	Relay Assembly, Start-Disconnect (Complete) Key 4 To Spec H (Use with Load Transfer Only)
29	306B28	1	Relay, Start-Disconnect, Key 4, To Spec H (Use with Load Transfer Only)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
30	301B1493	1	Cover, Start-Disconnect Relay Key 4, To Spec H (Use with Load Transfer Only)
31	BRACKET, RECEPTACLE BOX		
	301B1983	1	Key 1,3, Begin Spec H, Repl. 301B1866)
	301C1609	1	Key 10, To Spec H
	301C1869	1	Key 8,9,10, Begin Spec H
32	330-16	1	Cover, Recept. Box, Key 1,3 To Spec H (Also Key 8 To Spec C)
33	323B203	1	Box, Recept., Key 1,3, To Spec E (Also Key 8 to Spec C) Include Bracket
34	330-5	1	Box, Recept., Key 1,3, Spec E through G (Mts. on Fuel Tank Bracket)
35	PLUG, 3-PRONG		
	323P215	As Req.	Parallel Blades (120-V)
	323P216	As Req.	Tandem Blades (240-V)



1	STARTER KIT (COMPLETE) INCLUDES CUP AND MOUNTING RING -		
	192K270	1	To Spec H
	192K343	1	Begin Spec H
2	192P273	1	Cup, Starter Engaging
3	RING, ADAPTER, STARTER TO ENGINE HOUSING		
	192C269	1	To Spec H
	192C341	1	Begin Spec H
4	815-191	4	Screw, Machine, Self-Tapping
5	192P274	1	Flange, Middle
6	518P205	1	Ring, Retainer
7	526-142	1	Washer, Brake Retainer
8	192P275	1	Spring, Brake
8	192P276	2	Washer, Brake
10	192P279	2	Washer, Friction
11	192P277	1	Lever, Brake
12	192P278	2	Plate, Friction Shoe
13	192P280	2	Spring, Friction Shoe
14	192P281	2	Plate, Spring Retainer
15	192P282	1	Handle - Includes Washer

16	192P283	1	Cord Only, Rewind Starter
17	192P284	1	Rotor (Rope Sheave)
18	192P285	1	Spring, Rewind
19	192P287	1	Pin, Centering
20	192P286	1	Cover, Starter
21	809-44	3	Screw, Sheet Metal, #10 x 1/2" Starter, To Spec H
21	813-98	4	Screw, Round Head, #10-32 x 3/8" Starter, Begin Spec H
22	870-119	3	Nut, Tinnerman, U-Type
23	104A237	1	Screw, Cup Mtg. (with Pilot)
24	526-141	1	Washer, Flat, Cup Mounting
25	856-3	4	Washer, Starter Ring to Engine Housing. Quantity 3 used to Spec H
26	850-55	1	Washer, Lock - Cup Mounting
27	192P339	1	Roller, Rope
28	192P340	1	Screw, Roller



SPECIAL PARTS GROUP FOR IDLEMATIC CONTROL

Refer to standard groups for parts not listed here. Use Key 8 for models 102AK-51ML, 102AK-52ML, 105AK-2ML, and 105AK-2ML. Use Key 9 for models 102AK-51PL, 102AK-52PL, 105AK-1PL, and 105AK-2PL.

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	150B792	1	Bracket, Solenoid, See Note	11	150A793	1	Link, Idle Control
2	150B795	1	Cover, Solenoid	12	150A115	1	Spring, Idle Control
3	SOLENOID, IDLE -			13	150A796	1	Stud, Idle Control
	307P604	1	120-V Models	14	518-192	3	Clip, Angle, Solenoid Mounting
	307P669	1	240-V Models	15	308-2	1	Switch, Idle Solenoid
4	150A794	1	Lever, Idle, See Note	16	302B147	1	Transformer
5	510P73	1	Bearing, Idle Lever	17	307A62	1	Relay, Idle Control
6	150A638	1	Joint Ball, Idle Lever to Solenoid	18	323-52	1	Socket, Relay - Idle Control
7	145A241	1	Link, Solenoid	19	332A406	1	Block, Terminal, 3-Place
8	508-91	1	Bushing, Solenoid Plunger	20	301C1898	1	Box, Receptacle
9	516-125	1	Pin, Link-to-Solenoid	21	301C1899	1	Cover, Receptacle Box
10	815-231	1	Bolt, Stripper, 1/4-20", Idle Lever	22	150A98	1	Spring, Governor
				23	150A213	1	Stud, Governor

NOTE: Prior to serial 740,000 order 150K972.

OPTIONAL GAS FUEL SYSTEM GROUP (Not Illustrated)

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	148K510	1	Kit, Gas Conversion, Contains Garretson Regulator plus required parts (Replaces 148K337 & 148K511)		143A268	1	Valve, Main Adjusting Needle (For 143B88 Carburetor)
	CARBURETOR, GAS FUEL				143A413	1	Valve, Main Adjusting Needle (For 143B160 Carburetor)
			Key 8,9,10		148A412	1	Counterweight, Choke (Gas Only) If for 143B88 Carb., also order 815-230 counterweight adjusting screw.
	143B88	1	To Spec H (Use 143B160)		149A136	1	Cover, Fuel Pump Opening
	143B160	1	Begin Spec H		149A3	1	Gasket, Fuel Pump Opening Cover
			Key 1 through 7		505-17	1	Bushing, Reducer, 3/8" to 1/4", (For Garretson Reg.)
	143B88		To Serial No. 626862 (Use 143B160)		505-21	1	Bushing, Reducer, 3/4" to 1" (For Ensign Regulator)
	143B160	1	Begin Serial No. 626862		505-99	1	Nipple, Close, 1/4" x 7/8" (For Garretson Regulator)
	148A428	1	*Regulator, Gas Pressure, (Ensign Manufacture Model F) Replaces 148-9 (Model F)		505-38	1	Elbow, 1/4" (For Garretson Regulator)
	148C311	1	*Regulator, Gas Pressure, (Garretson Manufacture)		505-302	1	Nipple, Half, 1/4" x 1-1/2", (For Garretson Regulator)
	501A25	1	Hose, Reg.-to-Carb. (for Ensign Manufacture Regulator Only)		505-57	1	Plug, Pipe, 1/8"
	503A315	1	Hose, Reg.-to-Carb. (for Garretson Manufacture Regulator Only)		148P390	1	Repair Kit, Gas Regulator, (Garretson Regulator)
	503-27	1	Clamp, Hose, (for Ensign Manufacture Regulator)		148-300	1	Repair Kit, Gas Regulator, (Ensign Regulator Model F)
	503-32	2	Clamp, Hose (for Garretson Manufacture Regulator)		148-522	1	Repair Kit, Gas Regulator (For Ensign Regulator Model F)
	148A107	1	Vent, Atmospheric (for Garretson Manufacture Regulator Only)				
	148A269	1	Plate, Choke				
	803-2	1	Screw, Set, Counterweight-to-Choke Shaft				

* - Order components according to manufactures name on regulator.

OPTIONAL OIL BASE HEATER GROUP (Not Illustrated)

333-100	1	Element, Oil Base Heater (Replaces 333-3)	333A13	1	Cover, Thermostat
309-29	1	Thermostat	133A3	1	Guard, Thermostat
333A12	1	Box, Thermostat	333A17	1	Cable, Heater Connection

SERVICE KITS AND MISCELLANEOUS

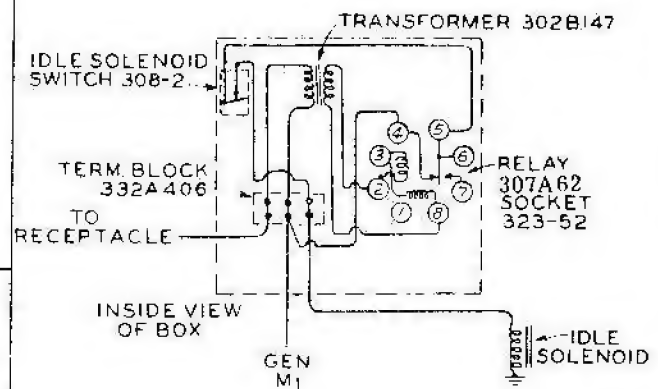
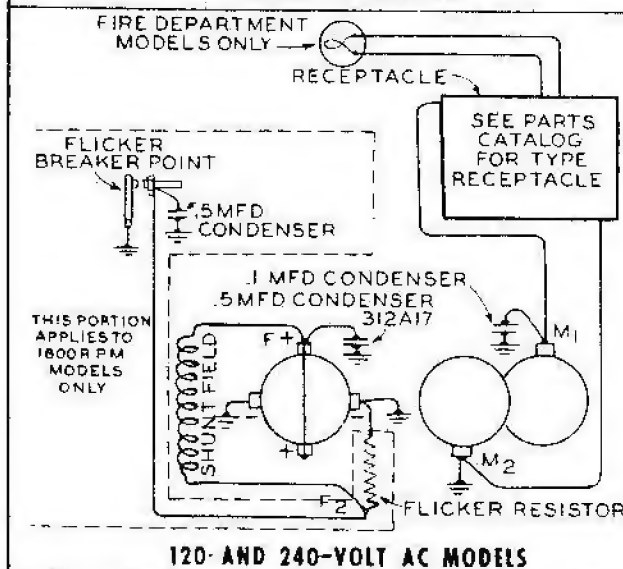
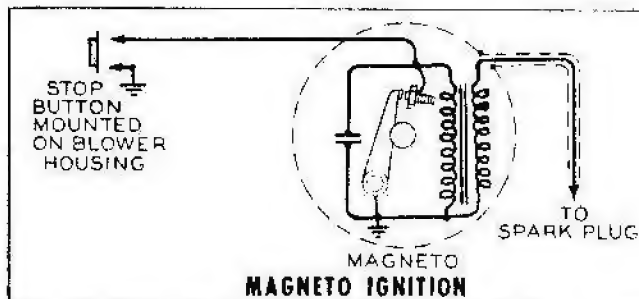
168K62	1	Gasket Kit, Plant	522K213	1	Overhaul Kit - Std. (Does not include Gen. Brushes, Rubber Mts., or Fuel Pump Repair Kit)
525P90		Paint (Pressurized Can) 12-Ounce Mouse Grey Enamel			
525P137		Paint (Pressurized Can) 16-Ounce Green Enamel			
412B4	1	Cover, Canvas, Weatherproof (Accessory)			

NOTE: For other kits, refer to the group for the part in question.

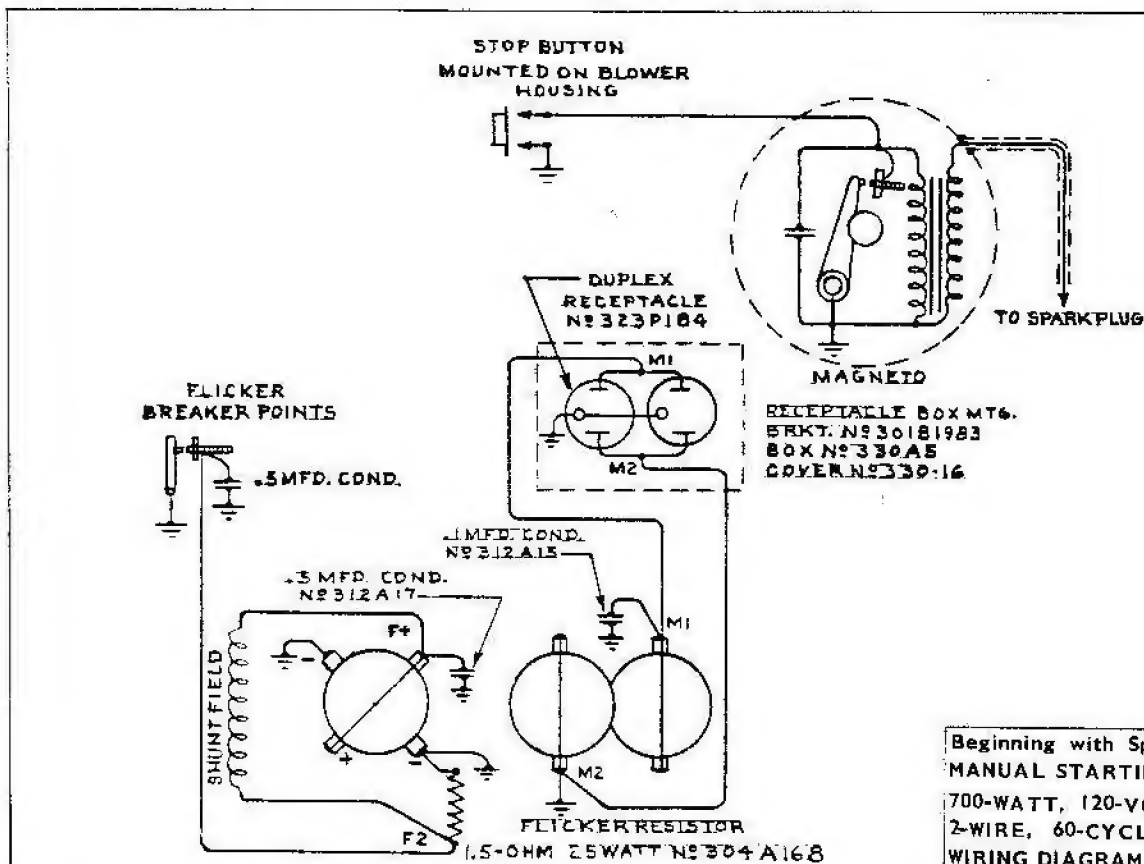
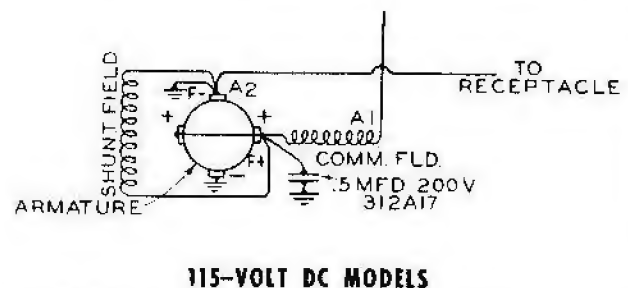
WIRING DIAGRAMS

The wiring diagrams in this section are typical and apply only to standard generating plants. Wiring diagrams for special models are available on request from the factory; send generator model, spec, and serial numbers with the request.

For revolving armature plants, select the generator wiring diagram with the proper phase and number of output wires.

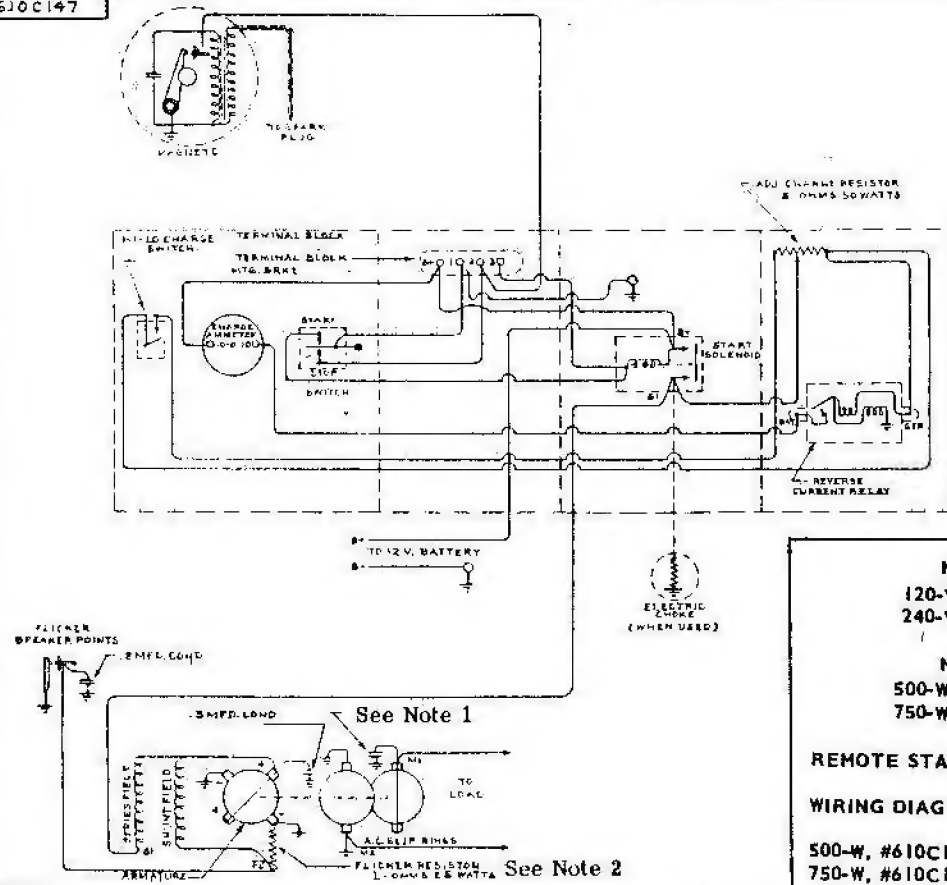


OPTIONAL IDLE MATIC CONTROL



Beginning with Spec H plants -
MANUAL STARTING AC PLANT
 700-WATT, 120-VOLT, 1-PHASE
 2-WIRE, 60-CYCLE, 1800-RPM.
WIRING DIAGRAM #601A84

610C147



610B144

